Montana Major Facility Siting Act (MFSA) Application

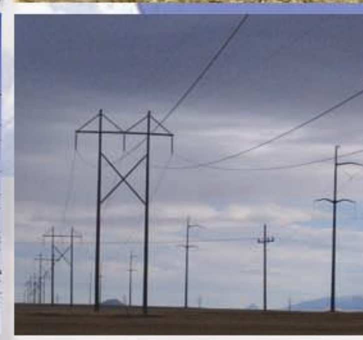
Montana Alberta Tie Ltd. Project
230 kV AC Power Transmission Line
Lethbridge, Alberta - Great Falls, Montana

1 December 2005

Revised August 2006







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MONTANA MAJOR FACILITY SITING ACT (MFSA) APPLICATION
MONTANA ALBERTA TIE LTD. PROJECT
230 kV AC POWER TRANSMISSION LINE
LETHBRIDGE, ALBERTA – GREAT FALLS, MONTANA

Submitted To:

Montana Department of Environmental Quality
Facility Siting Program
1520 East Sixth Avenue
P.O. Box 200901
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December 1, 2005

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ADDENDA TO APPLICATION

1.0 INTRODUCTION

Montana Alberta Tie Ltd. (MATL), a private corporation owned by a consortium of investors led by Rocky Mountain Power, LECTRIX LLC, and Tonbridge Power, is proposing to construct and operate a 240/230-kV AC merchant transmission line between Great Falls, Montana and Lethbridge, Alberta. MATL has prepared this application document in accordance with the Montana Department of Environmental Quality's (MDEQ's) *Circular MFSA-2, Application Requirements for Linear Facilities,* (MDEQ 2004), which clarifies requisites and provides guidance to electric transmission project applicants. MATL anticipates that MDEQ and the U.S. Department of Energy (DOE) will "co-lead" the regulatory agency role for review and approval of the proposed project. Other participating agencies with interest, but lesser roles in the project approval process include: Montana Department of Fish, Wildlife, and Parks (FWP), Montana State Historic Preservation Office (SHPO), Montana Department of Natural Resources and Conservation (DNRC), U.S. Department of Agriculture Farm Services Administration, and U.S. Fish and Wildlife Services (USFWS).

Through its discussions with MDEQ and DOE personnel, MATL expects that environmental review and disclosure of the proposed project will be conducted under the auspice of the National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA) following acceptance of this application. In anticipation, MATL intends that the information provided herein, and supporting documentation will meet the informational needs required for the pending NEPA/MEPA review.

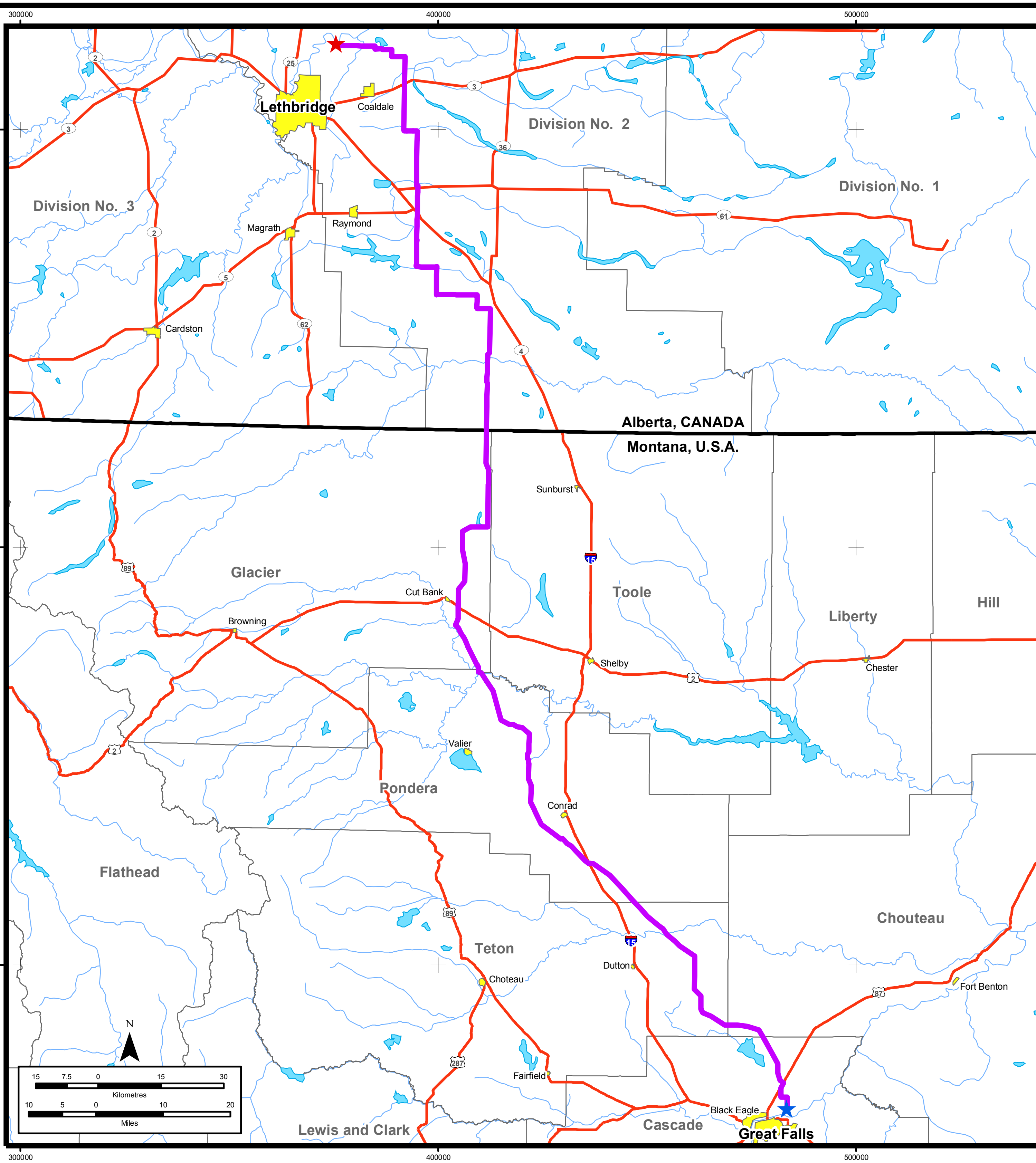
The approximate 190-mile line would connect the Alberta Interconnected Electrical System operated by the Alberta Electric System Operator (AESO), and Northwestern Energy's (NWE's) transmission system at the 230-kV Substation just north of Great Falls. Though both systems are part of the Western Interconnection, a phase shifting transformer will be installed to control power flows between the two regions. **Figure 1-1** provides a map showing the location of the proposed project along with key ancillary facilities.

Although this application addresses only the U.S. portion of the proposed project, MATL is proactively attempting to address both Canadian and U.S. regulatory agency needs under a coordinated project planning, development, and execution process. MATL anticipates and will facilitate coordination among MDEQ, DOE, Canadian National Energy Board (NEB), and Alberta Energy Utilities Board (AEUB) to minimize duplication of efforts associated with regulatory permits and approvals.

1.1 Purpose and Need

The Project would be the United States' first power transmission interconnection with Alberta and is expected to facilitate development of additional sources of generation (e.g., windfarms both in northern Montana, and southern Alberta), and improve transmission system reliability in Montana, Alberta, and on a regional basis in both the U.S. and Canada. In addition, the Project would promote increased trade in electrical energy across the international border, and provide a transmission route to balance energy surplus/shortage situations in an efficient and economic manner.

Figure 1-1 – Project Location Map



Legend

- Proposed Transmission Route
- MATL Owned Substation
- NorthWestern Energy Substation
- Cities / Towns
- Highways
- Lakes
- Rivers

Montana Alberta Tie Ltd.

Project Location

DATE: August 2005	PROJECTION: UTM Zone 12	DATUM: NAD83
JOB No: CE03202		
GIS FILE: Transmission Routes		
PDF FILE: Transmission Routes 08-09-06		

Figure 1-1

1.1.1 System Feasibility Study

MATL retained ABB Consulting to carry out preliminary power system studies ("Phase I Studies") that indicated clear and significant benefits to transmission in both Alberta and Montana (ABB 2005). Phase I Studies included both quantitative (technical), and qualitative (subjective) analyses.

Quantitative analysis was based on the PTI PSS/E complex model using the Western Electrical Coordinating Council (WECC) system data including the proposed MATL system to demonstrate system stability under steady state powerflow (with N-1 contingency), and system impact under selected stressed system operating conditions. The AESO provided 2006 peak load case including recently approved transmission projects. In addition, NorthWestern Energy provided three load levels of Light Autumn, Light Spring, and Heavy Summer. In all cases the WECC system planning criteria was applied.

These modeling efforts generally concluded that the proposed MATL Project is technically feasible. The MATL transmission line would be capable of transferring 300 MW north to south, and 300 MW south to north under the base case, pre-contingency, steady state (all transmission in service) conditions. Some MATL transfer limitations occur during extreme AB-BC counter flow situations because the limit of the phase shifting transformer is reached.

Qualitative analysis was based on input provided by the Technical Advisory Committee (representatives from AESO), U.S. Department of Energy Western Area Power Administration (Western), and NWE. Experience and knowledge of current and anticipated usage of the existing transmission in Montana, Alberta, and regionally were the basis of these contributions. Qualitative evaluation was intended to supplement the technical feasibility analysis by considering capacity usage and future development of Alberta and Montana transmission capability.

Findings and conclusions of the qualitative evaluation of the proposed Project's feasibility indicated the following regional transmission benefits:

- MATL would provide Alberta market participants direct access to the Northwest U.S. market. Conversely, Montana would have direct access to the Alberta and British Columbia markets and indirect access to the Washington state market during certain export scenarios.
- MATL would provide transmission system reliability and stability benefits to Alberta and Montana under several import/export scenarios. In addition, system reliability in Alberta would also be enhanced during significant generation outages.
- MATL would serve to promote development, optimal allocation, and mitigate the volatility of generation resources such as wind energy.
- MATL would provide greater flexibility in scheduling generator and transmission system maintenance throughout the Alberta/Montana region.
- Montana's transmission infrastructure would realize greater revenue from increased opportunity (non-firm) service utilization caused by MATL during non-constrained periods.

More comprehensive "Phase II Studies" (in-progress) will facilitate the posting of available transmission capacity on the AESO and NWE systems. As a result, Phase II findings will enable MATL, AESO, and NWE to negotiate and execute definitive interconnection agreements.

1.1.2 Open Season

MATL held an Open Season between February 3, 2005 and April 15, 2005 to allocate transmission rights using a market driven, fair, non-discriminatory, open and transparent process. The Open Season was developed to allow the market sufficient opportunity to assess the benefits and risks of the project and to allow bidders time to respond. The Open Season closed on April 15, 2005. In the Open Season, MATL offered all of the available capacity (600 MW) to the Project. MATL received 13 bids for transmission rights from four different companies. MATL accepted bids totaling 420 MW. All conforming bids were accepted. Two non-conforming bids by one company totaling 100 MW were rejected. **Table 1-1** summarizes the MATL Open Season.

TABLE 1-1
OPEN SEASON SUMMARY
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Accepted Bids				
Company Name	**Total Capacity Bid/Awarded (MW's)**	**Direction of Power Flow**	**Market Clearing Price (Can. $/kW – mo.)**	**Contract Term (years)**
Great Plains Wind and Energy	120/120	South to North	$3.72	15
GE Energy Inc.	175/175	North to South	$3.47	15
TransCanada Power	25/25	North to South	$4.34	5
Rejected Bids				
Company Name	**Total Capacity Bid/Rejected (MW's)**	**Direction of Power Flow**	**Reason for Bid Rejection**	
Powerex	100/100	50 MW's south to north, and 50 MW's north to south	Non-conforming bids. Bid rate below floor price, elimination of the annual escalator and changes to language in TSRPA.	

MATL's bid opening process was observed and documented by an independent auditor from the firm Grant Thornton (Thornton 2005). Thornton's report concluded: "While the stipulated bid opening and evaluation procedures were not followed in all cases, MATL took reasonable and appropriate steps in the circumstances to keep the bid handling process open and non-discriminatory".

MATL filed an Open Season report with the U.S. Federal Energy Regulatory Commission (FERC) on May 16, 2005. On July 5, 2005, FERC concluded: "Based on the information provided by MATL in its (Open Season) Report, we find that the Open Season process employed by MATL was non-discriminatory, fair, and transparent. Accordingly, the Open Season process as described in the Report is accepted." (FERC 2005).

While the commitments for transmission resulting from MATL's Open Season ensure viability of the proposed Project, the associated generation facilities are only reasonably certain to be constructed at this time. Due to additional market research results and anticipated shipper demand, MATL and its investor group are committed to funding and building the Project independent of the projects associated with the Open Season.

In addition, MATL had an additional Open Season between June 9th and June 30th, 2006. Using this system, MATL received 37 bids from 4 different companies. The total amount of capacity that was requested was in excess of 2000MWs. Ultimately, 180MWs was awarded to Energy Logics, Inc. for a 24-year term starting in the first quarter of 2008. MATL also awarded 120MWs of capacity to Wind Hunter LLC for an approximate 25-year term starting in 2007, and 180MWs of capacity to Invenergy Wind Montana LLC for a 25-year term.

1.1.3 FERC Filing

MATL filed an *Application for Authority to Sell Transmission Rights at Market-based Rates* to FERC on April 1, 2005 (Swidler 2005). The intent of MATL's proposed project is to enable buyers and sellers of power to transact for power across the Canada/U.S. border, and as a result, increase trade in electrical energy between Alberta and the United States. Once in service, the project will allow markets on both sides of the international border to have efficient and economic access to existing and new generation sources, such as wind farms. It also will facilitate additional sources of generation, provide transmission routes during tight supply situations, and improve electric reliability in both Alberta and Montana.

Since May 2000, FERC has granted authorization to sell transmission rights at market-based rates in a number of cases. Examples include projects sponsored by TransEnergie Ltd. in 2000 (FERC 2000), Neptune Regional Transmission System LLC in 2001 (FERC 2001), and Northeast Utilities Service Co. in 2002 (FERC 2002), and most recently Conjunction LLC in 2005 (FERC 2005). As a result, MATL's proposed project meets FERC's over-arching initiative to promote grid expansion by permitting innovative transmission construction and pricing proposals.

Finally, 10 criteria used to evaluate requests for authority to sell transmission rights at market-based rates have surfaced during the aforementioned FERC decisions. Content of MATL's *Application* to FERC adequately demonstrated fulfillment of these criteria including:

- Assumption of full market risk;
- ISO/RTO control of facilities under the open-access transmission tariff;
- Creation of tradable firm secondary transmission rights and posting on OASIS;
- Employment of an open season process in a non-discriminatory, fair and transparent manner;
- Address of affiliate concerns;
- Continued access to essential facilities by competitors;
- Subjectivity to market monitoring;
- Coordination of physical energy flows with relevant ISO/RTO; and,
- Non-impairment of pre-existing property rights of transmission grids or interconnected RTOs or utilities.

1.1.4 Existing & Desired Levels of System Reliability

This section addresses specific factors identified in ARM 17.20.907:

According to conclusions outlined in NorthWestern Energy's Montana Alberta Tie Line System Impact Study (Provided as **Appendix I** of this Application):

> *"The results from the steady-state power flow co-existing studies confirm no electric transmission system improvements are required to provide a reliable connection of the Montana Alberta Tie Line under system normal conditions. However, the system may need mitigation schemes for N-1 outage conditions. The mitigation will be identified in the WECC Three Phase Path Rating study.*
>
> *The results from the transient stability power flow studies indicate no problems exist with MATL line in place and hence no mitigation schemes are needed."*

(a) existing/desired levels of reliability. Existing levels of local system reliability is determined by NorthWestern Energy (NWE), the regional control authority. NWE's system reliability (i.e., security and adequacy) criteria from different engineering points of view are to find how any additions impact the electrical system. NorthWestern Energy is responsible for maintaining acceptable system reliability, and must be certain that any degradation of system reliability as a result of additional connection are within the tolerance levels of NorthWestern Energy's and the Western Electricity Coordinating council's performance criteria. The reliability criteria include a steady-state analysis that can reveal possible steady-state voltage problems, thermal line or equipment overload problems and reactive margin (i.e., Var margin) problems.

For the Western Electrical area, system reliability levels are determined by WECC. MATL is in the process of satisfying system reliability impact issues through the WECC Three Phase Path

Rating process, and will submit the final study as an Appendix to this Application when it becomes available.

For Alberta, local system reliability levels are determined by the AESO. In general, the criterion for MATL to interconnect into the AEIS is to have no detrimental effect the existing system. Any detrimental effect has to be mitigated by MATL, which will be identified in WECC Path Rating process.

(b) rationale. The rationale according to the NorthWestern Corporations Operating Agreement is: " 'Safety and Reliability Requirements' means all that is required by Good Utility Practice, together with all Applicable Laws and all applicable provisions of the reliability criteria, standards, guidelines and operating procedures of NERC, NWPP, WECC, Institute of Electrical and Electronic Engineers, United States Notional Electric Safety Code and other organizations that govern the planning, design, and operation of a Party's electrical system."

(c) planning assumptions. Assumptions are determined by authorities above. In general, projects proposed prior to the MATL application are included in reliability studies. Assumptions that were made in the NorthWestern Corporation Impact Study include the following network system upgrades required for the senior queued projects which were included in the system models for the 2010 and the 2012 cases:

- Judith Gap generator limited to 150 MW for the loss of Judith Gap South – Broadview 230-kV line
- RAS in service for the Hardin generator
- Existing 100 MVA, 230-100 kV autotransformers at Great Falls 230-kV Switchyard replaced with 200 MVA 230-100 kV transformers.
- Second 230 kV line from Great Falls 230 kV Switchyard – Ovando in service
- RAS in service for 268 MW generator at Great Falls.

For the WECC Path Rating process planning assumption used for reliability study are provided by the members of the Project Path Rating Work Group. The Work Group is made up of system planning engineers from utilities in British Columbia, Alberta, Montana and Washington.

(d) frequency of interruptions. MATL is not expected to interrupt service in connecting areas. MATL is expected to improve service reliability by providing alternative sources of power for the Great Falls, Cut Bank, and Lethbridge areas.

(e) evaluation of alternatives. Reliability is not the driving factor for implementing the MATL line. Alternative levels of reliability are determined by the authorities that govern the planning, design, and operation of a Party's electrical system: NERC, NWPP, WECC, Institute of Electrical and Electronic Engineers, United States Notional Electric Safety Code.

1.1.5 Transient Stability Considerations

This line is not being built to address a known reliability problem. NorthWestern Energy (NWE) has studied this question, and found that *"the co-existing study did not find any stability problems associated with connecting the MATL 230 kV line to the Great Falls 230 kV Switchyard"* (NorthWestern Energy MATL System Impact Study (SIS) Stand alone and Co-existing page 10, Dec. 22, 2005). (Provided as **Appendix I** of this Application). The following issues are addressed below, per requirements of ARM 17.20.920 and 921**:**

(1) Normal or contingent operating conditions where problem exists: NWE studied worst case fault events after a three-phase fault which causes loss of one or more transmission lines to identify problems. No stability problems were determined. WECC stability studies are in progress.

(2) Two stability studies showing problem and solution: Currently, NWE's System Impact Study looked at two cases: the WECC 2005 light autumn adjusted for 2010 and the WECC 2008 heavy summer adjusted to 2012 cases were studied. No stability problems were determined. WECC cases are under development by the MATL path rating review group. These results will be added as an Appendix to this Application when they become available (Estimated August or September 2006).

1.1.6 Power Transfer Capacity/Voltage Drop Considerations

The following issues are addressed below, per requirements of ARM 17.20.922 (a-f) and 17.20.923:

(a) Normal and thermal ratings effect on the power flow. MATL is applying for intertie path rating of 300 MW. The power transfer capacity and voltage drop are not a basis for need, therefore, inapplicable. However, the thermal rating limits may not be the limiting factor for transfer capability.

- Normal 300 MW Continuous
- Emergency 320 MW Voltage stability at Cut Bank
- Thermal 350 MW PST average summer

(b) Identify standard for power factor and voltage drop limit. The contractual power factor is determined between interconnecting parties and discussed in the Interconnection Agreement. Voltage drop limits for nominal steady state is +/- 5% p.u. Refer to **Appendix I** (NorthWestern Energy SIS page 9, Item 2 under Transient Stability Analysis).

(c) Identify acceptable voltage drop limit for contingency. Voltage drop limits for post transient state at n-1 contingency is +/-5% p.u. and n-2 contingency is +/- 10% p.u.

(d) Applicable voltage drop standards. WECC standard for voltage drop:

- N-0 condition +/- 5% p.u.
- N-1 condition +/- 5% p.u.

(e) Minimum of 3 load flow studies w/ assumption. For the NWE system refer to attached Impact Study with two load flow studies and the assumptions. The results show no voltage mitigation is required. The WECC path rating work group is in the process of running two load flow studies, which are, at this time, inconclusive. This report will be submitted as an Appendix to this application when it becomes available.

(*f) 10 year load growth area***.** Not applicable. While this tie line provides a new capacity for future load growth; this tie line wasn't proposed to specifically address future load growth.

For more information, please refer to NorthWestern Energy's Montana Alberta Tie Line System Impact Study (December 22, 2005) (**Appendix I** of this Application). Information may also be available in the WECC 3-Phase Path Rating Study; Phase 2 of WECC will be provided an Appendix to this Application when it becomes available.

1.1.6 Economic Considerations

The following economic issues are addressed below, per requirements of ARM 17.20.924 (a-g):

(a) System costs for 10 years with and without line. Because this is a merchant line and the cost of which is paid by shippers (hence not paid by Montana rate payers), the interconnection of the MATL line will not add new system costs. (There is no relationship between this line and system costs.)

(b) *Analysis of markets:* Lukens Energy Group produced a report "Valuation of the Proposed Montana Alberta Transmission Line", ("Luken's Energy Report") which provides a range of economic information concerning the proposed 230-kV line. See "Lukens Energy Report" – Attached to this submittal as **Appendix J** for a full analysis of markets.

(c) *Analysis of sources and prices for purchased power:* The Lukens Energy Report's analysis looks at both historical prices, as well as forward value to obtain information on power flow exported from, and imported to Alberta from the Mid-C power market area of the US (Washington, Montana, Oregon, Idaho). See Luken's Energy Report (**Appendix J**) for an analysis of sources and prices for purchased power.

(d) *Demand and price for wheeling services*. Please see the results of MATL's initial open season for evidence in terms of demand and price for transmission services. MATL believes there is demand for remaining unsold capacity, which will be sold through MATL's OASIS system.

(e) *Other analysis that shows need/financial viability, (f) relationship of capacity to projected flow and (g) why the proposed facility is preferred to use of existing capacity:* The Lukens Energy Report (**Appendix J**) determined that there is ample opportunity to trade energy between Alberta, mid-Columbia markets and determined that the tie line would be economically viable. In addition the construction and operation of the tie line also provides opportunities for local economic development in Montana via development of wind energy projects that could also interconnect to the line.

1.2 Regulatory Framework

Figure 1-2 illustrates the process required by participating regulatory agencies to conduct environmental review and issue appropriate permits necessary for construction and operation of the proposed project. Each of the primary steps within the regulatory process leading to final regulatory approval and permitting is outlined in the following discussion.

1.2.1 MFSA-2 Application

The initial step in the regulatory process is filing of the MFSA-2 Application (this document) required by MDEQ under the authority of the Montana Major Facility Siting Act (MFSA), Title 75, Chapter 20, MCA. The MFSA-2 Application is comprised of the following successive components:

"Delineation" – identification of the project study area that includes all reasonable facility end/exit points within or outside Montana. Project boundaries will be justified with respect to avoidance of key areas (e.g., national parks and primitive areas) and inclusion of all alternatives considered.

"Overview Survey" – collection and mapping of environmental information within the study area for the purpose of selecting alternative facility locations.

"*Alternatives Siting Study*" – environmental/economic analysis to identify a preferred location for a proposed linear facility based on minimum adverse environmental impacts with consideration given to available technology and economics of alternatives.

"Baseline Study" – the detailed analysis of a proposed route for a linear facility and potential impact zones for purposes of impact assessment and comparison and selection of a preferred facility location.

A detailed discussion of MATL's efforts to site both the preferred and feasible alternative routes for the transmission line in Montana is provided in Section 2. That discussion identifies, attempts to prioritize, and dismisses certain siting criteria derived from the *MFSA-2 Circular* that were considered in the alternatives analysis.

Figure 1-2 – Regulatory Framework

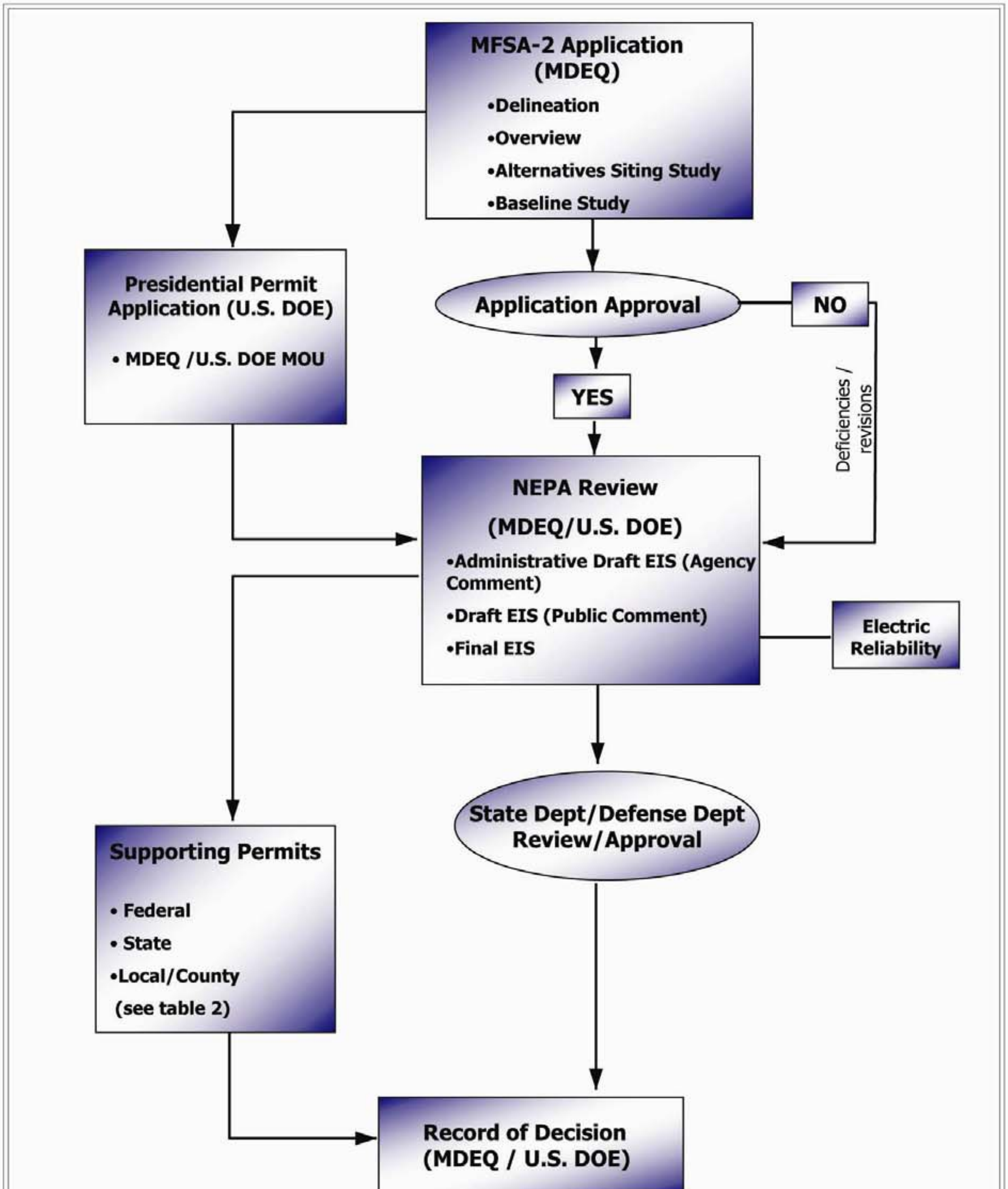


Figure 1-2
Regulatory Framework
Montana Alberta Tie Ltd.
Lethbridge, AB - Great Falls, MT

1.2.2 Presidential Permit

Executive Order 12038 states that, before a Presidential Permit may be issued, the action must be found to be consistent with the public interest. The two criteria used by the DOE Office of Electrical Delivery and Energy Reliability to determine if a proposed project is consistent with the public interest are: (1) *Environmental Impact*, and (2) *Impact on Electric Reliability*. *Environmental Impact* analysis in accordance with NEPA will be discussed in greater detail in the following section.

DOE's evaluation of *Impact on Electric Reliability* relies on standards established by the North American Electric Reliability Council (NERC) and member regional councils that are formulated by the utilities themselves. DOE considers acceptable voltage, system loading, and system stability during normal and emergency conditions when evaluating reliability in response to proposed project impacts.

After compliance with NEPA and satisfaction of the electric reliability criteria, E.O. 12038 requires DOE to obtain concurrence from the Secretary of State and the Secretary of Defense before a permit may be issued.

1.2.3 NEPA/MEPA Review

The procedures used in preparation of an EA or EIS are to provide for formalized public involvement in the decision-making process. The NEPA/MEPA document discloses what the decision-maker considered in reaching his or her decision on the Proposed Action and alternatives. MATL anticipates the following key steps in the review process with noted contributions of this MFSA-2 Application (consciously organized to an EA format) to that process.

Scope of Analysis

Scope consists of the range of actions, alternatives, and impacts to be considered in the NEPA/MEPA document. Basically, this step will be used to determine if the proposal is complete and fully described, and what, if any, program specific requirements for information remain to be satisfied. "Scoping" defines the parameters within which the analysis will be conducted, and brings focus to the analysis early in the process. Finally, this step determines if certain activities and/or actions can be included in the Proposed Action (e.g., special design features or management practices to avoid or minimize potential impacts, or reduce a public or agency issue to less than significant).

Purpose Of and Need for the Proposed Action

This statement briefly specifies the underlying *Purpose and Need* for the Proposed Action to which MDEQ and DOE are responding. Key elements of the Purpose and Need statement include:

- Project justification based on economics and transmission system reliability.
- Explanation of the lead agency decision(s) and identification of other agencies involved the analysis.
- A summary of potential issues and concerns, rationale for inclusion in the analysis, anticipated level of significance, and associated analysis criteria.
- Identification of local, state, and Federal permits, licenses, and authorizations necessary to implement the decision.
- As appropriate, identification and discussion of issues/route alternatives considered, but eliminated from detailed analysis.

- Identification of other on-going or approved projects in the Study Area, and existing NEPA/MEPA documents that might contribute to or influence the scope of the analysis.

Proposed Action and Alternatives

Sufficient definition of the *Proposed Action* (Preferred Route Alternative) allows adequate and thorough analysis of potential impacts. Consideration and assessment of alternatives would result if unresolved and non-mitigable conflicts associated with land use and/or resources arise during analysis.

Affected Environment

This step in the environmental review process involves the identification of the current conditions and trend of elements in the human environment (resource areas) likely to be affected by the Proposed Action or alternatives. Although this key step focuses the document on those elements and only those with true potential to be impacted, all elements of the environment will be reviewed in sufficient detail to determine if they will be affected. Critical elements considered for review are defined under Section 102(2) of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4332, DOE NEPA Implementing Procedures (10 CFR Part 1021), Section 75-1-103 Montana Code Annotated (MCA) Administrative Rules of Montana (ARM) 17.4.601, and ARM Title 17 Chapter 4, Subchapter 6. These review elements are consistent with *Circular MFSA-2* siting criteria are addressed herein through literature review and supplemental field surveys.

Environmental Consequences

Determining *Environmental Consequences* requires analysis of direct, indirect, and cumulative impacts on the Affected Environment for the Proposed Action and each alternative to the extent necessary to determine if the impacts are significant. The analysis of impacts will be based on the premise that all design features or management practices intended to avoid or minimize environmental effects are inherent to the Proposed Action. Finally, it is assumed that analysis is based on best available information, is objective, and quantified where possible.

1.2.4 Supporting Permits

In addition to MDEQ and DOE, other local, state, and Federal agencies have jurisdiction over certain aspects of MATL's proposed project. **Table 1-2** provides a comprehensive listing of agencies and their respective permit/authorizing responsibilities with respect to the proposed project.

TABLE 1-2
SUMMARY OF SUPPORTING PERMITS
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Permit/Approval	Issuing Agency	Description	Authority
Federal			
Presidential Permit	**U.S. Department of Energy**	Permit must comply with NEPA and Electric Reliability criteria. DOE must obtain concurrence of Secretary of State and Secretary of Defense before permit can be issued.	Executive Order 12038
Section 404	**U.S. Army Corps of Engineers**	Controls discharge of dredged or fill materials in wetlands and other Waters of the U.S.	Section 404 of the Clean Water Act (33 CFR 323.1, 330)
Notice of Proposed Construction/ Alteration	**Federal Aviation Administration**	Structure location, height, lighting, and documentation relative to air traffic corridors.	49 USC 1501 13 CFR 77, Objects Affecting Navigable Airspace
Safety Plan	**Occupational Safety & Health**	Provide guidance to on-site construction worker safety along with emergency contacts,	

TABLE 1-2 SUMMARY OF SUPPORTING PERMITS MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
Permit/Approval	**Issuing Agency**	**Description**	**Authority**
	Administration	routes, etc.	
Tariff Review and Approval	**Federal Energy Regulatory Commission**	Approval of rates for transmission in interstate commerce for jurisdictional utilities, power marketers, power pools, power exchanges and independent system operators.	Federal Code of Regulations, Title 18
Review Authority	**U.S. Department of Defense/U.S. Air Force**	Review of construction plans for power pole placement for distubance of buried cables for Minuteman missile silos.	Consultation and concurrence
Section 309 (Clean Air Act)	**U.S. Environmental Protection Agency**	Ensures project complies with Act with regard to transmission line construction activities.	40 CFR Subchapter C, Air Programs
Consultation	**DoD Homeland Security**	Presently required by U.S. security policy.	Consultation and concurrence
Informal Section 7 Consultation	**U.S. Fish and Wildlife Service**	Identifies any species and its habitat listed as endangered or threatened that may be impacted by the project.	Federal Endangered Species Act of 1973
Line Rating	**Western System Coordinating Council**	Three phases of line rating approval. Not required, but provides protection if negative impacts occur.	Asset protection
State			
Certificate of Compliance	**Montana Department of Environmental Quality**	Reviews project application, conducts reviews of project impacts, approves and coordinates other permit activities.	Montana Major Facility Siting Act
Section 401 Permit	**Montana Department of Environmental Quality**	Provides review of potential adverse water quality impacts from discharges associated with dredged or fill materials in wetlands and other Waters of the U.S.	Montana Water Quality Act
Air Quality Pre-Construction/Operating Permit	**Montana Department of Environmental Quality**	Permit for the construction, installation, and operation of equipment or facilities that may directly or indirectly cause or contribute to air pollution.	75-2-211, MCA: Preconstruction permit 75-2-217 MCA: Operating Permit
Land Use License (DS-432)	**Montana Department of Natural Resources and Conservation**	Licensing structures and improvements on state lands and across navigable water bodies.	Title 77, MCA
Pre-construction Authorization	**Montana Department of Natural Resources and Conservation**	Authorizes construction prior to easement grant by the Board of Land Commissioners	85-2-402 and 85-2-407, MCA
Utility Crossing Permit	**Montana Department of Transportation**	Grants utility crossing permits for transmission line and access roads that may encroach on state maintained routes.	RW 131 and/or RW20
Section 106 of the National Historic Preservation Act	**State Historic Preservation Office**	Consults with project applicants and state agencies regarding impacts on cultural resources that are either listed or eligible for listing on the NRHP.	Montana Antiquities Act (22-3-421 through 442, MCA)
North Western Energy Rate Impact	**Montana Public Service Commission**	Approval could be required if rates of North Western Energy are impacted.	Montana Public Utility Commission Regulations
Local/County			
Noxious Weed Management Plan	**County Weed Control Districts**	Provides containment, suppression, and eradication of noxious weeds.	Title 7
Easement Grants and Road Crossing Permits	**Boards of County Commissioners**	Consider issuance of right-of-way easement grants and road-crossing permits for county property and roadways.	

1.2.5 Mitigation Measures

Mitigation measures outside of avoidance, developed by MATL for the MFSA-2 Application are intended to be directly applicable to the pending NEPA/MEPA review. MATL anticipates that projected mitigation effectiveness would be fully evaluated, applied, and disclosed during the assessment. MATL also anticipates that direct, indirect, or cumulative impacts that would remain after application of the mitigation measures would also be identified and weighed in the final decision. Mitigation (environmental protection) measures are discussed in greater detail in Section 2.0 of this application.

2.0 STUDY AREA DELINEATION [MFSA-2, 3.2]

Circular MFSA-2 states: "The alternative siting study is required in order to identify a preferred location for a linear facility that will accommodate the facility for which a need is established and for which there are no better alternatives given the environmental and economic costs and benefits." MATL has confidently demonstrated *Purpose and Need* (see Section 1.0) for the proposed Project based on a *Phase I System Feasibility Study* (ABB 2005), results of an *Open Season*, and the *FERC Filing* for authorization to freely trade electrical transmission across the Canada/U.S. international border. With need for the proposed Project established, this section discusses MATL's delineation of a Project Study Area based on *Circular MFSA-2* criteria.

2.1 Study Area Mapping [MFSA-2, 3.2.1 and 3.2.3]

MATL considered several alternative routes within the Project Study Area depicted on **Figure C-1** (Appendix C) with the over-arching project objective of siting, and designing a 230-kV transmission line that would be economical and feasible to construct considering the anticipated environmental and land use constraints. **Figure C-1** meets *Circular MFSA-2* requirements for the *Study Area Delineation Base Map*. These requirements include:

- Identification of proposed facility end points within and exiting Montana [MFSA-2, 3.2.1.a and b]
- Geographic area between end/exit points sufficient to include all reasonable locations for the proposed facility [MFSA-2, 3.2.1.c]
- Avoidance or disclosure of Delineation criteria [MFSA-2, 3.2.1.d.i – xi]
- Scale = 1:250K displayed on a USGS topographic base [MFSA-2, 3.2.3]

2.2 Delineation Criteria [MFSA-2, Section 3.1.1.d.i - xi]

MATL considered the 11 Delineation criteria identified in *Circular MFSA-2* [MFSA-2 3.2.1.d.i – xi, page 9] during its delineation of the Project Study Area and preliminary assessment of route alternatives within that area. These Delineation criteria, as prescribed by MDEQ, are denoted with a "D" in **Table 2-1** below. Seven of these 11 criteria, denoted with an asterisk (*), are not present in the Project Study Area. These criteria that MATL dismissed from further consideration, include the following:

- National wilderness areas (nearest: Bob Marshall Wilderness, approximately 70 miles east of Great Falls)
- National primitive areas (the only formally recognized primitive area in Montana is Humbug Spires, located approximately 30 miles south of Butte)
- National parks and monuments (nearest: Glacier National Park, approximately 45 miles west of Cut Bank; Upper Missouri River Breaks National Monument, approximately 112 miles east of Conrad)
- State parks (nearest: Giant Springs, approximately 4 miles northeast of Great Falls and approximately 2 miles southwest of the southern terminus of the proposed Project)
- National wild and scenic river corridors (nearest: Missouri River at Fort Benton, approximately 40 miles northeast of Great Falls)
- Roadless areas >5,000 acres managed by Federal or state agencies (nearest: bordering Bob Marshall Wilderness)
- Specially managed buffer areas surrounding national wilderness areas and primitive areas (although not formerly recognized, the nearest would occur adjacent to the Bob Marshall Wilderness)

Delineation criteria (Section 1.2.1) that occur within the proposed Project Study Area include the following:

- Benton Lake National Wildlife Refuge is located in the southern portion of the Project Study Area, approximately 8 miles directly north of Great Falls. MATL has evaluated its approaches to NWE's 230-kV Substation from both the northwest and north with intent to avoid Benton Lake.
- U.S. Fish and Wildlife Service (USFWS) administers five Waterfowl Production Areas (WPAs) within or adjacent to the Project Study Area under the jurisdiction of the Benton Lake Wetland Management District (a 10-county area). These WPAs are identified as Brown, Cemetary, Peterson, Brumwell, and Hartelius. MATL has considered and avoided these five WPAs throughout its siting studies.
- Rugged topography, defined by MDEQ as areas with slopes >30 percent are located primarily along the Marias River and Teton River corridors. The proposed Project will be unable to avoid these areas, however, MATL has attempted to minimize the length of these areas that must be crossed through siting. In addition, MATL anticipates addressing these steep, and erosion prone slopes through system design, and appropriate mitigation.
- The Kevin Rim Area of Critical Environmental Concern (ACEC) was identified as an area potentially meeting the Delineation criteria as a "national recreation area". ACEC is a Bureau of Land Management (BLM) designation, and because of the lack of information available regarding the Kevin Rim, MATL assumes that this designation is based on the potential for the area to provide important wildlife habitat. MATL has avoided the Kevin Rim Area throughout its siting studies.

Table 2-1 – Summary of Siting Criteria following pages

2.3 Delineation Boundaries [MFSA-2, 3.2.4, page 10]

In accordance with Circular MFSA-2 requirements, the following discussion is provided to explain MATL's methods and considerations in determining the boundaries of the Project Study Area.

North

The northern extent of the U.S. Project Study Area encompasses exit/entry points between Alberta and Montana along the international border that MATL considered during early stages in its siting studies. These include locations approximately 25 miles directly north of Cut Bank in proximity to the currently preferred route and parallel alternative routes (indicated with a "star" on Figure C-1). These generally define the northwest corner of the Project Study Area and reflect MATL's attempts to minimize overall project distance, avoid Blackfoot Reservation lands, consider siting of the route(s) in southern Alberta, and give consideration to potential wind energy development in the Cut Bank area.

The northern Project Study Area boundary is further defined by early considerations of Canada/U.S. border crossings near the Sweet Grass Port-of-Entry along U.S. Interstate Highway 15 (I-15). Route alternatives considered in this vicinity would roughly parallel I-15 south to Shelby. MATL's early dismissal of alternatives along I-15 will be discussed in Section 4.3.3 ("Alternatives Considered but Dismissed from Detailed Study").

East

The eastern Study Area boundary from the Canada/U.S. border at Sweet Grass south to Shelby is defined by MATL's consideration of the potential to roughly parallel I-15. As a result, an easternmost alternative paralleling I-15 within 2 miles to the east defines the extent of the Project Study Area.

MATL considered land use, land ownership, and topographical features in early decisions regarding potential route alternatives traversing from Shelby south to Great Falls. Although these eastern alternatives minimized diagonal routing through north/south and east/west paralleling of county roads along Township, Range, and Section lines, substantial increases in overall project distance (and therefore cost) resulted. In addition, other siting difficulties were realized, including:

- Potential for crossing lands administered by the U.S. Bureau of Land Management (BLM) in the vicinity of the Marias River west of Tiber Reservoir.
- Increased distances over "rugged" topography (slopes >30%) along the Marias River with associated engineering difficulties and cost.
- Increased potential for occurrence of cultural resource sites in undisturbed coulees and drainages associated with the Marias River "breaks".

West

The northern approximate one-third (approximately 45 miles) of the Project Study Area western boundary is defined by the eastern boundary of the Blackfoot Reservation. The remaining approximate two-thirds of the western boundary runs in a general southeasterly direction along existing transmission lines. MATL's considerations to potentially rebuild and/or roughly parallel existing transmission lines in a single corridor running diagonally cross-country has defined the western edge of the proposed Project Study Area. This approach would meet MATL's objective minimizing total project distance and cost. In addition, this approach would potentially result in minimization of environmental impacts by consolidating land use requirements of the proposed Project with those of existing facilities. However, several key issues associated with this approach will be disclosed and discussed in detail in succeeding sections of this application. These include the following:

- Interaction with other linear facilities (e.g., petroleum pipelines, and railroads) in addition to existing transmission lines
- Addition or compounding of hindrances to dry land farming practices resulting from placement (side-by-side or staggering) of transmission line structures
- Avoidance and/or mitigation of land use practices or features that have occurred along the existing transmission line corridor since the time of its construction (approximately 30 to 40 years)
- Substantial increases to project costs resulting from decommissioning and construction of a temporary transmission line to allow decommissioning and rebuild of an existing 115-kV transmission line

South

The southern boundary of the proposed Project Study Area is defined by the location of NWE's 230-kV substation, the southern terminus of the proposed line, and the alternative routes coming into that substation. MATL has considered approaching the substation from the northwest, and directly from the north, west and east of Benton Lake National Wildlife Refuge, respectively. Although both approaches are restricted by residential development, "point" facilities (e.g., antennas), and Benton Lake, the north approach offers an advantage in a direct tie-in to an open bay of NWE's substation. In addition, MATL's evaluation of the northwest approach versus the north approach realized a greater level of concern for the following:

- Increased potential for visual impact as viewed from several designated recreational sites along the Missouri River
- Potential difficulties and expense associated with potential crossings or paralleling of the Western Area Power Administration (Western) 230-kV transmission line
- Existing and potential residential, commercial, and industrial development immediately north of Great Falls

3.0 STAKEHOLDER CONSULTATION [MFSA-2 3.3.2 and 3.7.6.a – d]

MATL facilitated stakeholder consultation to allow an early and open process for determining the scope of issues and concerns related to the proposed Project. Consultations conducted during the course of preparing the MFSA Application included those with lead and participating agencies, non-governmental organizations, the general public, and Native American tribes. This section summarizes those efforts, comments recieved, and MATL's responsiveness. In addition, MATL project team members completed a Record of Contact (ROC) for individuals in attendance at public informational meetings, and those spoken to individually while conducting field studies. ROCs are provided in **Appendix B**.

3.1 Regulatory Agencies

MATL and personnel from participating agencies engaged in numerous meetings and discussions throughout the duration of the MFSA Application filing process. Those interactions considered noteworthy are summarized below:

3.1.1 <u>Pre-Filing Agency Consultation</u>

MATL representatives met with MDEQ personnel on May 9, 2005 to introduce the proposed Project and discuss key issues or concerns during initial stages of the MFSA Application process. These included the following:

- *Routing Criteria:* MDEQ suggested that MATL consider utilization of secondary and/or county road right-of-ways, avoidance of wetlands, and parallel routing to field strips within strip-farmed areas.
- *Design Criteria:* MDEQ emphasized pole design to minimize interference with farming practices, raptor protection, minimization of potential electro-magnetic field (EMF) issues, and bird strike avoidance.
- *Public/Agency Consultation:* MDEQ recommended public information meetings in key communities with emphasis on informing attendees of the proposed Project, gathering input regarding landowner concerns, and demonstrating responsiveness to those concerns.
- *MFSA Application:* Content of the siting guidance document (*Circular MFSA-2*), and the Application process were discussed and clarified. General discussion topics included: *Circular MFSA-2* lack of guidance regarding format, required 30-day Application review period, and submittal of draft versions or portions of the Application for MDEQ review.
- *NEPA Review:* MDEQ indicated that the level of Montana Environmental Policy Act/National Environmental Policy Act (MEPA/NEPA) review required would be decided only at the time of MDEQ's acceptance of MATL's MFSA Application. MDEQ also indicated its acceptance of the Application in an EIS/EA type format.
- *Presidential Permit:* MDEQ suggested the development of a Memorandum of Understanding (MOU) between MDEQ and the U.S. Department of Energy (DOE) as an initial step toward meeting NEPA and Presidential Permit requirements in a "parallel" process to satisfying MDEQ's MEPA and MFSA-2 requirements.

3.1.2 <u>Interagency Project Meeting</u>

MDEQ hosted an Interagency Project Meeting on August 26, 2005 in Helena, Montana with the intent to familiarize participating agency personnel with the proposed Project, field agency questions, and formalize agency roles and responsibilities. Meeting attendees included personnel from the following agencies:

- MDEQ
- U.S. Department of Energy (DOE; via teleconference)
- Montana Fish, Wildlife, and Parks (FWP)
- Montana Department of Transportation (MDT)
- Montana State Department of Commerce
- Montana Department of Natural Resources and Conservation (DNRC)

Following introductions, and a project presentation, discussion ensued regarding the level of MEPA/NEPA review that would be required to adequately disclose and assess MATL's proposed Project. Although DOE assumed that an Environmental Impact Statement (EIS) would be required, DOE also expressed that an Environmental Assessment (EA) may suffice with the common understanding of the inherent risks associated with an expedited NEPA review. MDEQ stated that an EIS/EA decision would be made upon approval of the MFSA Application. In response, DOE substantiated Montana's vested interest in the proposed Project, and indicated their support to follow MDEQ's lead on an EIS/EA decision.

Other substantive comments received from meeting attendees included the following:

- DNRC brought forward issues regarding reserved water rights, and State Trust Land. MATL had previously identified lease of State Trust Land as a "supporting permit" to be addressed in parallel to the MEPA/NEPA review, however DNRC recommended immediate dialogue to assure that that issue is fully addressed.
- MDEQ and MATL representatives discussed the appropriate treatment of potential wind energy development in the Cut Bank area during the MEPA/NEPA review of MATL's proposed Project. Treatment as "reasonable and foreseeable" as opposed to "connected" appeared appropriate and acceptable.
- MDT requirements regarding height/span, highway safety recovery zone, encroachment permit, and utility occupancy agreements were brought forward. MDT's meeting representative recommended that MATL contact MDT's Great Falls District for appropriate guidance and permitting.
- MDEQ reminded MATL of the Proof of Public Notice requirement for the MFSA Application. An Application summary must be published in area newspapers, and a copy of that notice provided in the Application.
- Scope of cultural resource surveys and involvement of MDEQ and State Historic Preservation Office (SHPO) were discussed with attention focused on development of a Memorandum of Understanding (MOU) to guide those studies.

3.1.3 Individual Agency Contacts

MATL personnel met with agency representatives individually on several occasions to address concerns, and/or clarify *Circular MFSA-2* requirements. These discussions are summarized below:

- A representative of the MDEQ Major Facility Siting Program was consulted with on August 19, 2005 to clarify visual impact assessment requirements. As a result, MATL's MFSA Application will reflect the guidance and suggestions during that consultation including those regarding assessment of potential impacts to visual quality, compatibility, and contrast on both a landscape perspective, and from key observation points (e.g., occupied residences, recreation sites, National Historic Places).

- A game biologist for Region 4 of the Montana Fish, Wildlife, and Parks (FWP) was consulted on May 2, 2005 regarding concerns and appropriate level of study for special status wildlife species that may occur within the Project Study Area. Potential concerns posed by the proposed Project expressed during that meeting included: increased perch opportunities for birds of prey and potential resulting impacts on swift fox, and sharptail grouse populations.
- A MATL representative contacted the U.S. Fish and Wildlife (USFWS) Refuge Supervisor for USFWS Benton Lakes National Wildlife Refuge and USFWS Ecological Services personnel in Helena, Montana, on several occasions. Primary topics of those discussions centered on migratory and feeding flight paths of waterfowl using the refuge and bird strike mitigation practices. In response to MATL's inquiries, Benton Lake indicated that the refuge does not have GIS/location data to address those potential issues of concern at this time, and MATL has committed to implementing state-of-the-practice bird strike avoidance measures on a site specific basis through future consultation with USFWS personnel.
- A MATL representative contacted the USFWS Wetland District Manager for Benton Lakes National Wildlife Refuge to discuss procedures for approving siting of the proposed line within areas enrolled in the USFWS Wetland Easement Program. USFWS indicated that a compatibility evaluation would need to occur concurrent with the MDEQ MEPA process.

3.2 Public Informational Meetings

Open House Sessions were held from 4:00 to 8:00 pm in Conrad and Cut Bank, Montana on June 29 and 30, 2005 to provide the public an opportunity to meet the project team and obtain information on the scope of the project. These Open Houses also provided a venue for the public to voice and document their concerns and issues to members of the project team.

Notification

Advertisements were posted in the following weekly newspapers for a 3-week period starting on June 12: *The Valierian, The Cut Bank Pioneer Press, The Glacier Reporter*, and *The Shelby Promoter*. The ad also appeared in the June 21 issue of *The Western Breeze* (Cut Bank), the June 22 issue of *The Independent-Observer* (Conrad), and the June 24 issue of *The Prairie Star* which is published in Great Falls and distributed state-wide to farm and ranch families. The Cut Bank meeting was announced on the Northern Ag Network on June 30.

Meeting Format

Stations staffed by project representatives provided project background, schedule, design, and environmental assessment information. Maps were provided to show the entire study area (Montana and Alberta) and routes being considered for the transmission line. Maps were also made available to mark areas or features that visitors felt the project team should consider in their assessment.

Upon arrival, Open House visitors were greeted by project staff and provided with a description of the project, a sheet of frequently asked questions, and a pamphlet introducing MATL.

Attendees were also asked to register, enabling them to stay informed about the proposed Project through mailings.

Data Recording

Comments received during the Open Houses were recorded in a number of ways. The project team filled out comment sheets identifying issues or concerns that they heard and an exit survey was passed out to all participants. After each Open House, a debriefing took place among the team members; this allowed team members to share comments and information heard during the Open House and formed an important basis to the team's understanding of information provided by the participants.

Comment Summary

Although numerous comments were received during the public informational meetings held in Cut Bank and Conrad, several substantive topics surfaced among those comments. These included the following:

- Meeting attendees repeatedly expressed their concerns regarding the proposed Project's potential to affect dryland cultivation practices. Attendees indicated that existing transmission line structures located on cropped farmland pose a hindrance to implements, result in additional fuel, fertilizer, and herbicide/pesticide costs, and promote noxious weed growth around the base of the structures.
- Potential interference of existing and planned mechanical irrigation, particularly pivot systems, surfaced as a primary and repeated concern of meeting attendees.
- Several meeting attendees expressed interest in development of alternative energy resources (wind energy) on their individual properties, or in the area. As a result, MATL representatives fielded a repeated question/concern regarding the proposed Project's contribution or role in alternative energy development.
- Based on the general agriculture-based economy of the region, attendees expressed interest in the economic benefits that the proposed Project would provide. Comments and questions centered on promotion of new industry, and increases to the local tax base.
- Concerns regarding paralleling of the existing NWE 115-kV transmission line surfaced in public comments. These comments primarily centered on impediments to farming practices compounded by a double line of poles, and the existing presence of pipelines, and fiber optics lines in that general corridor.

3.3 Non-Governmental Organizations

Table 3.3-1 summarizes MATL's attempts to contact and discuss the proposed Project with various non-governmental organizations. Although the majority of those organizations identified in Table 3.3-1 have been generally non-responsive, productive discussions have been held with several including the following:

- A Ducks Unlimited (DU) regional biologist was contacted by telephone and indicated that DU is not involved in advocacy work and is generally not concerned about transmission lines. DU relies on the USFWS and state wildlife agencies to conduct monitoring and population studies. DU did express interest in involvement if habitat restoration areas could potentially be affected by the proposed Project.

- MATL hosted a presentation to interested non-governmental organizations in Helena, Montana on August 28, 2005. Only a representative from the Montana Stock Growers Association attended. Concerns of the Stock Growers focused on the proposed Project's potential to impact farming practices with emphasis on irrigated farmland, and strip-cropping activities.

TABLE 3.3-1
NON-GOVERNMENTAL ORGANIZATIONS CONTACTED
MONTANA ALBERTA TIE LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Organization	Contact Person	Contact Information
Ducks Unlimited	Layne Krumwiede Regional Director	1023 West St. Lewistown, MT 59457 (406) 538-9094
Northern Plains Resource Council	Teresa Erickson Staff Director	2401 Montana Ave. Suite 200 Billings, MT 59101 (406) 248-1154
Montana Environmental Information Center	Patrick Judge Energy Program Director	P.O. Box 1184 Helena, MT 59624 (406) 443-2520
Montana Stock Growers Association	Steve Pilcher Director	420 No. California Ave. Helena, MT 59601 (406) 442-3420
Montana Grain Growers Association	Keith Schott President	750 6th St. S.W. P.O. Box 1165 Great Falls, MT 50403 (406) 761-4596
The Nature Conservancy	Susan Benedict Program Associate	32 South Ewing Helena, MT 59601 (406) 443-0303
Montana Land Reliance	William Long Managing Director	324 Fuller Ave. P.O. Box 355 Helena, MT 59624-0355 (406) 443-7027
National Audubon Society, Montana Chapter	Janet Ellis Acting Exec. Director	P.O. Box 595 Helena, MT 59624 (406) 443-3949
Alternative Energy Resources Organization	--	432 N. Last Chance Gulch Helena, MT 59601 (406) 443-7272
Natural Heritage Program	Sue Crispin Director	1515 East 6th Avenue P.O. Box 201800 Helena, MT 59620

3.4 Tribal/First Nations

MATL will attempt to address Tribal (U.S.) and First Nations (Canada) interests in the proposed Project with a proactive approach that provides for open disclosure of the Project, involvement of Tribal and First Nations Councils in the project-planning process, and inclusion of Tribal and First Nations members on field survey teams where appropriate. A meeting was held with the Blackfeet Tribal Council in Browning, Montana on September 12, 2005. As a result of that meeting MATL will propose that they will conduct a Traditional Knowledge Overview Study. At the present time the Tribal Council will be contacted to determine the proper protocol for moving forward.

MATL and representatives from its contracted engineering, environmental, and land agent firms met with Blackfeet Tribal Council members on September 12, 2005, in Browning, Montana to discuss potential effects on tribal economic, social, and traditional lands interests. Blackfeet Tribal Council members, staff, and interested parties in attendance included: Owna Scott-Big Bull, William Big Bull, John Murray, Teri Lawrence, Wendy Running Crane, Brian Crawford, Terry Tatsey, Douglas Quade, Curly Bear Wagner, Joseph Weatherwax, Kenneth Augare, Gerald Wagner, Pat Schildt, and Earl Old Person.

Following introductions and a brief project overview provided by MATL personnel, Blackfeet Councilmen, staff, and tribal members raised several substantive issues that were addressed or were recorded for follow-up. Substantive Blackfoot issues/comments included the following:

- Blackfeet representatives stressed the need to evaluate the proposed Project's potential to impact traditional landscape and land use values. Inclusion of tribal monitors during cultural surveys and/or review of cultural resource findings by Tribal Historic Preservation Office (THPO) personnel were suggested to assist in appropriate treatment of prehistoric findings. MATL is addressing Tribal issues with an appropriate level of cultural survey established through Memorandum of Understandings (MOUs) developed with MDEQ, U.S. DOE, the Montana State Historic Preservation Office (SHPO), and THPO.
- Compatibility to interconnect a Blackfoot-owned transmission line, and Blackfeet opportunity to bid for capacity on MATL's proposed transmission line were questioned. MATL responded that a second Open Season is likely during Fall 2005, and may be conducted as an ongoing real-time bidding program with the Blackfeet openly invited to participate in that program.
- Incorporation and documentation of Traditional Knowledge in the MFSA Application (if possible) and pending MEPA/NEPA review.

MATL directed the preparation of a proposal to implement a Traditional Knowledge Study that would incorporate scientific and technical information into the assessment and documentation of potential impacts to Traditional Knowledge concerns of the North and South Peigan (Blackfoot), and Blood tribes. These studies are anticipated to result in meaningful initiatives to mitigate potential Traditional Knowledge impacts through a cooperative effort by MATL and all Tribal/First Nations communities affected.

Fundamentals of the Traditional Knowledge Study include the following:

- Open and frequent consultation of Tribal/First Nations councils and/or designates to identify key environmental/cultural issues.
- Joint decision-making among MATL and Tribal/First Nations regarding key aspects of the assessment.
- Collaborative efforts to build capacity in planning, collection, analysis, management, and communication of Traditional Knowledge information gathered and/or addressed throughout the duration of the proposed Project.

TABLE 2-1
SUMMARY OF CIRCULAR MFSA-2 LINEAR FACILITY SITING CRITERIA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Phase	MFSA-2 Reference	Theme	Data Set	Impact Zone
		Soils/Geology		
D,O	3.2.1.d.x; 3.4.1; 3.7.7.a	Rugged Topography (slopes >30%)	NRIS 2005, 30m DEMs	X'd by Facility/Road
O	3.4.1.k, 3.7.7.a	Highly Erodible soils w/ Reclamation constraints	NRCS	"
O	3.4.1.w, 3.7.7.a	Active Faults for Substations, Switch Stations, End Points	USGS	"
O	3.4.5	Slope Classification	NRIS 2005, 30m DEMs	"
B	3.7.8.a	Wind/Water Erosion Risk	NRCS	"
B	3.7.8.b	Mass Movement Potential	NRCS	"
B	3.7.8.c	Reclamation Constratints	NRCS	"
		Hydrology		
O	3.4.1.h, 3.7.7.a, 3.7.18	Municipal Watersheds	DEQ	X'd by Facility/Road
O	3.4.1.i, 3.7.7.a, 3.7.10.h.xiv, 3.7.12.b.xi, 3.7.15.c.x	Class I/II Streams	FWP	X'd by Farility/Road w/in 3 miles
O	3.4.1.j, 3.7.7.a, 3.7.18	303(d) Streams	DEQ TMDL	X'd by Facility/Road
O	3.4.1.u, 3.7.7.a	Waterbodies >20 acres	USFWS NWI	"
O	3.4.1.v, 3.7.7.a, 3.7.18	Potable Surface Water Supplies	DEQ	"
B	3.7.9.f	100-year Floodplain	FEMA/DNRC	"
B	3.7.17	Classified Perennial Streams	FWP	"
		Vegetation/Wildlife		
O,B	3.4.1.b, 3.7.7.a, 3.7.12.viii	State/Federal Waterfowl Protection Areas	FWP/USFWS	1mile
	none	Migratory Birds	FWP/USFWS	--
O,B	3.4.1.d, 3.7.7.a, 3.7.12.b.x	*Critical Habitat for Listed Species	FWP/USFWS	1 mile
O,B	3.4.1.e, 3.7.7.a, 3.7.12.b.xiii	Seasonal Habitat for Listed Species	FWP	"
O	3.7.12.b.xv	Winter Distribution of Elk, Mule Deer	FWP	"
O	3.4.1.n, 3.7.12.b.xvi	*Major Elk Summer Security Areas	FWP	"
O	3.7.12.b.xvii	*Habitats Occupied by Sheep/Goat	FWP	"
O,B	3.4.1.p, 3.7.12.b.xviii	Grouse Breeding Areas and Winter Distribution	FWP, Field Studies	"
OB	3.4.1.q, 3.7.7.a, 3.7.12.b.xix	Prime Waterfowl Habitat	FWP/USFWS	"
B	3.7.12.b.xxi	Mature Riparian Forests	MTNHP GAP	"
B	3.7.12.b.xxii	Nesting Colonies	USFWS	"
B	3.7.12.b.xxiii	Habitats of State Species of Special Interest/Concern	MTNHP/FWP	"
O	3.4.3.g	Land Cover: non-timbered grassland or rangeland	GAP/CAMA	--
O	3.4.3.h	Land Cover: forested lands	GAP/CAMA	--
B	3.7.12.b.xxiv	Raptor Nests	MTNHP/FWP	½ mile
		Land Use		
D,O	3.2.1.d.i/xi, 3.4.1.a, 3.7.7.a,	*National Wilderness Areas/Buffers	MTNHP	2 miles

TABLE 2-1 SUMMARY OF CIRCULAR MFSA-2 LINEAR FACILITY SITING CRITERIA MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT				
Phase	**MFSA-2 Reference**	**Theme**	**Data Set**	**Impact Zone**
	3.7.10.h.ii, 3.7.12.b.xiv, 3.7.1			
D,O	3.2.1.d.i/xi, 3.4.1.a, 3.7.7.a, 3.7.12.b.xiv, 3.7.15.c.ii	*National Primitive Areas/Buffers	BLM	“
D,O	3.2.1.iii, 3.4.1.a;\, 3.7.7.a, 3.7.10.g.vi, 3.7.12.b.i, 3.7.15.d	National Wildlife Refuges/Ranges	USFWS	“
D,O	3.2.1.d.iv, 3.4.1.a, 3.7.7.a, 3.7.12.b.ii	State Wildlife Mgt. Areas/Habitat Protection Areas	FWP	¼ mile
D,O	3.2.1.d.v, 3.4.1.a, 3.7.10.h.iii, 3.7.15.c.iii	*National Parks and Monuments	NPS	2 miles
D,O	3.2.1.d.vi, 3.4.1.a, 3.7.7.a, 3.7.10.h.vi, 3.7.15.c.v	*State Parks	FWP	2 miles
D,O	3.2.1.d.vii, 3.4.1.a, 3.7.7.a, 3.7.12.b.iii, 3.7.10.h.v	*National Recreation Areas	BLM	¼ mile
D,O	3.2.1.d.viii, 3.4.1.a, 3.7.7.a, 3.7.10.h.vii, 3.7.12.b.vi, 3.7.1	*National Wild and Scenic Rivers Corridors	FWP	
D,O	3.2.1.d.ix, 3.4.1.a, 3.7.7.a, 3.7.10.h.viii, 3.7.12.vii, 3.7.15	*Roadless Areas >5000 acres	BLM/USFS	
O	3.4.4	Ownership Classification	CAMA	
O	3.4.1.c, 3.7.7.a, 3.7.10.h.ix, 3.7.12.b.ix, 3.7.15.c.viii	Federal and State Special Management Areas	USFWS/FWP/BLM/ NPS/USFS/GAP	
O	3.4.1.r	Undeveloped Land/Water	Counties/Municipalities	¼ mile
O, B	3.7.2.a, 3.7.19.a	Unincorporated Cities, Towns, and Residential Clusters	Counties/Municipalities	1 mile
O,B	3.7.2.b, 3.7.19.a	Developed Residential, Commercial, and Industrial Areas	CAMA	“
O,B	3.4.3.c, 3.7.2.c	Designated Residential Growth Areas	Counties/Municipalities	“
O, B	3.4.3.g	Non-Timbered Grassland/Rangeland	GAP	“
O,B	3.4.3.h	Forest lands (with timber harvest status)	GAP	“
O,B	3.4.3.j, 3.7.2.j	Military Installations	CAMA	“
O,B	3.4.3.k, 3.7.2.k	Conservation Easements (State or Federal only)	FSA/USFWS/FWP/GAP	“
O,B	3.4.3.n, 3.7.2.n	Cropland (mech. irr., other irr., and dry cropland)	CAMA	“
O,B	3.4.3.o, 3.7.2.o	Prime Farmland	NRCS	1 mile
O,B	3.4.3.p, 3.7.2.p	Permitted Mines	MDEQ	“
B	3.7.2.q	Platted Subdivisions	Counties/Municipalities	“
B	3.7.2.r	Major Public Buildings	Field Studies	“
B	3.7.2.t	Schools, School Land	MTDA	“
B	3.7.2.u	Agricultural Experiment Stations	MSU	“
B	3.7.2.v, 3.7.10.h.xvi, 3.7.19.a	Individual Residences	Field Studies	“
B	3.7.2.v	Major Farm Support Buildings	Field Studies	½ mile

TABLE 2-1
SUMMARY OF CIRCULAR MFSA-2 LINEAR FACILITY SITING CRITERIA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Phase	MFSA-2 Reference	Theme	Data Set	Impact Zone
B	3.7.2.w	Fence Lines >1/4 mile; Field Boundaries	Field Studies	Adjacet to CL
B	3.7.15.c.xi	Recreation Areas and Sites	FWP	3 miles
		Human Health and Environment		
B	3.7.19.a,d, g	Noise		1000' trans. line, 500' substations
B	3.7.19.b,c,g	Conductance/Inductance		1 mile
B	3.7.19.f,g	Radio and Television Interference		edge of ROW
B	3.7.19.e,g	Electric and Magnetic Fields		"
		Utilities		
O,B	3.4.3.f, 3.7.2.f	Transmission Lines >50 kV	MDEQ, Penwell	1 mile
O,B	3.4.3.i, 3.7.2.i	Point Communication Facilities	FCC	"
B	3.7.2.s, 3.7.19.c	Pipelines >8" in diameter	MDEQ, Penwell	"
		Transportation		
O, B	3.4.3.d,i, 3.7.c.d	Federal, State, and County Hwy's, Scenic Routes	MDT	1 mile
O,B	3.4.3.e, 3.7.2.e, 3.7.19.b	Railroads and Railroad Right-of-Ways	Fed. RR Admin.	"
O,B	3.4.3.l, 3.7.2.l	Airfield, Airspace, Hazards	MDT	"
O,B	3.4.3.m, 3.7.2.m, 3.7.10.h.xii, 3.7.15.c.ix	National Trails	MTSL	"
		Cultural		
O,B	3.4.1.f/g, 3.7.7.a, 3.7.10.h.x/xi	National Historic Landmarks, Districts, Sites		
O,B	3.4.1.s, 3.7.14.b.i	Geologic Units with High Probability of Paleontoligical Res.		
O,B	3.4.1.t, 3.7.14.b.ii	Native American Religious/Heritage Sites		
		Visual		
O,B	3.4.9.c, 3.7.10.a,d	Visual Quality/Contrast	M. Teply	3 miles
O,B	3.4.9.d, 3.7.10.b,c	Visual Compatibility/Contrast		"
B	3.7.10.e,f,g	Sensitive Receptors/KOP Viewsheds		"
B	3.7.10.d	Scenic Quality/Attractiveness/Contrast		"

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4.0 OVERVIEW SURVEY AND BASELINE IMPACT ASSESSMENT

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The following section describes the physical, biological, social, cultural, and visual resources within the Project Study Area as well as an evaluation of potential impacts to each resource associated with construction and operation of MATL's proposed 230-kV transmission line. The section's format follows the application requirements for linear facilities as set out in *Circular MFSA-2* which requires each resource to be described at both an "Overview" (general) and a "Baseline" (detailed) level. Findings and conclusions of these sequential steps in the MFSA Application process are presented on a resource-by-resource basis to eliminate unnecessary redundancy. Finally, each resource discussion concludes with predicted "Environmental Consequences", and discusses proposed environmental protection measures or mitigations to eliminate or minimize potential impacts, if necessary or appropriate.

4.1 Overview Mapping and Criteria

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Overview Survey refers to data collection and mapping of specific resources within the Project Study Area for the purpose of identifying alternative locations suitable for siting MATL's proposed Project. The *Circular MFSA-2* clearly indicates Overview requisites including map presentation of required criteria, disclosure of resources or methods used to evaluate those criteria, and conclusions resulting in selection of alternative facility locations.

MATL developed a two-map set (north and south half) of Overview base maps and resource overlays to meet *Circular MFSA-2* Overview Survey requirements [Circular MFSA-2, 3.3.3]. These Overview base maps and resource overlays are presented at a scale of 1:100,000 on a USGS topographic base; show township, range, and section lines; depict the proposed Project alternatives within the Project Study Area; are provided both electronically and on mylar; and are accompanied by supporting metadata. All Overview base maps and resource overlays are included in **Appendix D** to this application.

Overview criteria are provided in **Table 2-1** and are denoted with an "O" in the far left-hand column of that table. Based on general guidance for conducting Overview surveys provided in Section 3.3 of *Circular MFSA-2*, it is our understanding that Overview criteria are intended to guide the transmission line route selection process through avoidance of significant land use features, and important and/or sensitive physical, biological, and cultural resources.

4.2 Baseline Mapping and Criteria

Baseline Impact Assessment refers to a more detailed analysis that forms the scientific and analytic basis for the comparison of alternatives. Direct, indirect, and cumulative effects associated with project alternatives are evaluated on a resource-by-resource basis to meet the Baseline objective of identifying a Preferred Alternative.

MATL developed a 14-map set of Baseline base maps and resource overlays to meet *Circular MFSA-2* requirements [Circular MFSA-2, 3.6.2 and 3.6.3]. These maps and overlays are presented at a scale of 1:24,000 on a USGS topographic base; show township, range, and section lines; display county, state, and interstate roadways; and show Project alternatives in detail. MATL has provided these to MDEQ in both electronic and hard copy (mylar) format along with supporting metadata. All Baseline base maps and resource overlays are included in **Appendix E** to this application.

Baseline criteria are provided in **Table 2-1** and are denoted with a "B" in the far left-hand column of that table. Although sometimes redundant with Overview criteria, the intent of the Baseline

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Impact Assessment is to evaluate these criteria at a greater level of detail (relative to each alternative route) than previously completed so that a preferred transmission line route can be selected from the three proposed alternatives.

Specific criteria are identified in *Circular MFSA-2* Section 3.7. However, several additional general Baseline requirements intended to support those detailed assessments are provided in *Section 3.6* and include the following:

[Section 3.6.4]

Aerial photograph color contact prints providing complete physical aerial coverage of the alternative facility location meeting foliage and time requirements and used to conduct land use assessments. Provided in **Appendix F**.

Black and white stereo-aerial coverage for areas prone to mass movement and used to evaluate potential slope stability concerns along route alternatives. Provided in **Appendix F**.

[Section 3.6.5]

Information sufficient to determine compliance with all standards, permit requirements, and implementation plans administered by MDEQ. Supporting permits are identified in **Table 1-2**. Construction standards and plans along MATL commitments discussed in *Section 6.0 Environmental Monitoring and Follow-up Programs*

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[Section 3.6.7]

Identification and discussion of potential mitigations or environmental protection measures as appropriate including those associated with construction, maintenance, and operation of the proposed facility. Proposed measures are identified on a resource-by-resource basis in individual *Environmental Consequences* discussions, and a summary provided in *SubSection 5.3 Environmental Protection Measures.*

4.3 Project Alternatives

This section describes three proposed Project route alternatives, the no action alternative, and route alternatives that MATL considered but dismissed from detailed study during the conceptual phase of the project. MATL developed the alternatives presented and assessed in this MFSA Application based on anticipated potential impacts or issues, and input provided by the public, regulatory agencies, and non-governmental organizations during pre-application informational meetings and consultations.

4.3.1 Rationale for Project

The Montana Alberta Tie Ltd. Line is a merchant power line proposed to be built between Great Falls, Montana and Lethbridge, Alberta, which will interconnect the two jurisdictions. Several benefits would be realized by energy customers and potential energy producers. The line would improve transmission system reliability in both Montana and Alberta as well as on the Western grid. Studies by ABB, an electrical engineering consulting firm, and ongoing studies for WECC support this suggestion. The tie line will allow more alternative options for power routing within Montana, if a particular line was removed from service due to either an unexpected event or

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¶
Overview Survey refers to data collection and mapping of specific resources within the Project Study Area for the purpose of identifying alternative locations suitable for siting MATL's proposed Project. The Circular MFSA-2 clearly indicates Overview requisites including map presentation of required criteria, disclosure of resources or methods used to evaluate those criteria, and conclusions resulting in selection of alternative facility locations. ¶
¶
MATL developed a two-map set (north and south half) of Overview base maps and resource overlays to meet Circular MFSA-2 Overview Survey requirements [Circular MFSA-2, 3.3.3]. These Overview base maps and resource overlays are presented at a scale of 1:100,000 on a USGS topographic base; show township, range, and section lines; depict the proposed Project alternatives within the Project Study Area; are provided both electronically and on mylar; and are accompanied by supporting metadata. All Overview base maps and resource overlays are included in ***Appendix D*** *to this application.¶*
¶
Overview criteria are provided in ***Table 2-1*** *and are denoted with an "O" in the far left-hand column of that table. Based on general guidance for conducting Overview surveys provided in Section 3.3 of Circular MFSA-2, it is our understanding that Overview criteria are intended to guide the transmission line route selection process through avoidance of significant land use features, and important and/or sensitive phys* ... [1]

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scheduled maintenance. The Montana Alberta Tie could be used to supply power from the north during these emergencies.

The proposed line also has the potential to increase energy transactions between Montana and Alberta. This could save ratepayers money in certain situations. For example, if power was cheaper in Alberta than in Montana, it could be purchased on the spot market for Montana consumers for less money than would have been paid without the line. Such competition will tend to keep rates at lower levels. Balancing energy surpluses and shortages in Montana would potentially be made easier with easy access to power generators in Alberta.

Increasing energy transactions and having more options to balance energy surpluses and shortages would serve to increase the competition for Montana electricity users in a deregulated market, a tendency lowering or stabilizing electricity prices. Right now, for power to travel between Montana and Alberta, that power must first go west into Idaho, Washington, and British Columbia. Shippers incur several tariffs for transmission services using this route. By using the Montana Alberta Tie, the distance would be shorter and the number of tariffs involved fewer.

By increasing access to markets outside Montana, construction of both new coal and wind generation projects will be stimulated and other new producers of electricity would be encouraged to locate in Montana. The most promising developments to date are developers interested in constructing several wind farms in the proximity of Cut Bank, Montana as a result of the proposed line. They have signed agreements with MATL to ship power over the proposed line. The MATL line might also cause more non-firm usage of other transmission lines in Montana (those with excess capacity) and could lead to greater revenues for existing Montana transmission owners and generators.

4.3.2 Alternative Routes

Montana Alberta Tie Ltd. (MATL) has developed three (3) 230-kV transmission line route alternatives for consideration in its MFSA application to MDEQ, and Presidential Permit Application to the U.S. Department of Energy (DOE). These alternative routes are the southern extension of MATL's overall proposed project that originates in Lethbridge, Alberta and traverses south/southeast to its southern terminus near Great Falls, Montana.

All three routes were derived from consideration of the preferred location criteria identified in Circular MFSA-2 Number 3.1.1 a-k (described in more detail below), and other specific criteria important to MATL, including cost. Figure 4.1 shows a map of the three alternative routes, along with other considered, but dismissed routes.

Specifically, per the requirements of MFSA-2, 3.5.2 (Selection of Alternative Locations), the application must contain an explanation of methods utilized to identify alternative locations. This explanation must include a discussion of how the preferred location criteria in MFSA-2, 3.1.1 were incorporated into this identification process, how the alternatives identified also avoid specified sensitive areas as identified in MFSA-2, 3.2.1, and/or how any adverse impacts can be mitigated if alternatives would impact these areas, and how this process gave consideration to the environmental information collected to address MFSA-2, 3.4. Other criteria that can be included as part of overall methodology include cost, reliability, and engineering concerns as well as any other factors important to the applicant.

The three route alternatives (Preferred A, Alternative B, and Alternative C) cross the U.S./Canada border approximately 26 miles north of Cut Bank, Montana. Specifically, Preferred Alternative A crosses the border into Glacier County, approximately 1 mile west of the Glacier-

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Toole County border. The route alternatives converge approximately 10 miles north of Cut Bank and pass the town on the east side. Near the Glacier Electric Cooperative substation, located approximately 1 mile southwest of Cut Bank, the alternatives diverge traveling over roughly parallel routes east of the Blackfeet Indian Reservation along a southeastward trend. Routes A and B roughly parallel NorthWestern Energy's (NWE) southeastward trending 115-kV line along its entire distance to its tie-in to NWE's 230-kV substation north of Great Falls. Alternative C traverses to the east away from routes A and B at a location approximately 9 miles southeast of Brady, Montana and approximately 5 miles north of the Teton River. Alternative C jogs directly east and south to take advantage of existing north-south and east-west state highway and county road rights-of-way enroute to NWE's 230-kV substation. Major river crossings include the Marias River, approximately 10 miles south of Cut Bank, and the Teton River, approximately 14 miles south of Brady, Montana. Although several state highways are crossed by the three alternatives, only one crossing of Interstate Highway 15 occurs along each of Preferred A, Alternative B, and Alternative C.

MATL believes the proposed route (Preferred Alternative A) is best suited for the facility given that it is solidly consistent with the siting criteria established via MFSA Circular-2 and provides some additional benefits to MATL over the other two alternatives selected, in terms of design and maintenance considerations. For instance, Alternative C is the longest of the three proposed routes, and therefore would cost more to implement than either Alternative A or B. Alternative B is located nearer to the existing NorthWestern Energy 115-kV transmission line (compared to Alternative A) and has the potential for greater access issues and/or maintenance issues than the preferred route. In addition, Alternative A's location would allow greater opportunity to connect with potential wind energy development in the future. A further description of the criteria utilized to identify the preferred route and other alternatives follows:

Below is a discussion of methods utilized to identify alternative locations (Circular MFSA-2 Number 3.1.1 a-k), broken down by a discussion of how the preferred location criteria were applied. In addition to this summary, detailed discussions of resources encountered and/or potentially affected along each of the three alternatives are provided in the following sections of the application. Finally, in accordance with the route selection process established in *Circular MFSA-2*, the application rationalizes the selection of the Preferred Alternative through alternative comparison/ranking.

a. MFSA-2, 3.1.1a – Greatest potential for local acceptance. Much of the written and verbal comments received, as documented in *Appendix B – Stakeholder Consultation Records of Contact* of MATL's MFSA Application (dated December 1, 2005), show a concern for impacts to agricultural practices, including difficulties associated with navigation around transmission line structures on cropped ground, and potential interference with irrigation systems. Specific comments received during public informational meetings held in Conrad, and Cut Bank on July 12 and 13, 2006, respectively, are summarized by the following:

> *Cut Bank:* Two comments (Mr. Bill Van Alstine, and Mr. Hyland Lane) were received that suggested avoidance of irrigated and cultivated fields, and utilization of rights-of-way along existing rural roads and highways. Such efforts would minimize potential impacts to farming practices, and allow easier access for maintenance of the proposed facility.

> *Conrad:* MATL has record of one comment received from Mr. Larry Maurer regarding potential impacts to farming practices. Mr. Maurer suggested paralleling of existing transmission lines or roads.

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Other: MATL conducted an informational session in Helena, Montana on July 27, 2006 to inform special interest groups of the project. Mr. Jay Bodner representing the Montana Stockgrowers Association attended, and stated that the association had not heard of any farming/ranching landowner concerns to date. As a result, Mr. Bodner offered that opposition from the agricultural community would likely be minimal, and that the majority of farming/ranching landowners would likely be open to lease negotiations.

Based on this information:

- Special consideration was given to irrigated fields. Several were avoided and higher poles will be used to minimize impacts
- There is a tradeoff to be made with paralleling existing infrastructure e.g. highways and transmission lines and routing parallel to field boundaries. Two of our routes parallel the NWE line and one moves parallel to field boundaries. The sum of the various constraints led MATL to choose the preferred route.

b. MFSA-2, 3.1.1b – Where they utilize or parallel existing utility and/or transportation corridors. Siting of alternatives took into consideration the location of existing utility and transportation corridors within the entire Project Study Area in order to concentrate impacts. Specifically MATL examined whether any existing corridors could be utilized or paralleled as locations for its alternatives. Within the project area, NorthWestern Energy (NWE) has an existing 115-kV transmission line between Cut Bank and Great Falls. Given this, MATL chose to locate two of the three alternatives to roughly parallel this line; the goal being to concentrate impacts within already disturbed areas. In fact, MATL considered an actual rebuild/upgrade of the existing line, but the cost and logistics and interest of the line owner made this option infeasible.

Consideration was also given to utilizing the existing Highway 4 corridor in southern Alberta in order to connect with the I-15 corridor south from the Canadian border to Shelby. This option has appeal in that it could maintain infrastructure development in a common corridor. However it was not chosen as one of the three potential alternatives given the potential issues regarding safety control of the rail line that parallels Highway 4 in Alberta, congestion which increased engineering costs, as well as the existing land development patterns in the Shelby area. Land development patterns in southern Alberta, and in the Shelby area would necessitate the use of a stairstep-like centerline resulting in increased distances, and numerous guy wire locations because of deflection angles exceeding one degree all of which increase costs. Other factors such as the cost of river crossings in areas with much wider river valleys and eroded slopes and terrain led to the acceptance of the more westerly route.

c. MFSA-2, 3.1.1c - To allow for selection of a location in nonresidential areas. Siting decisions for the three alternatives were made with specific consideration of MFSA-2, 3.4.3(a-c) so that selected routes would cross over primarily nonresidential areas. Particular attention was paid to avoiding cities, towns, unincorporated communities, and residential clusters of 5 or more dwelling units per 20 acres, based on a circle of 1,000 feet in diameter within the Project Study Area (as defined by MFSA-2, 3.4.3a). Additionally, specific consideration was given to avoiding developed residential, industrial and commercial areas adjoining cities and unincorporated communities (MFSA-2, 3.4.3c), and designated residential growth areas (MFSA-2, 3.4.3c).

The entire project area is comprised of a largely rural landscape, dominated by agriculture. There is little condensed residential development outside of incorporated areas. Exceptions include several Hutterite colonies, as well as a few residential clusters, most notable of which are along the North Santa Rita Road, approximately 5 miles to the north from Cut Bank, and in the north Great Falls area, between the City of Great Falls and Benton Lake National Wildlife

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Refuge. There are individual residences and farmsteads located throughout the entire project area.

Siting decisions included a specific attempt to bypass all incorporated areas including Great Falls, in Cascade County; Power and Dutton, in Teton County; Conrad and Brady, in Pondera County; Shelby, Sunburst, and Sweetgrass, in Toole County; and Cut Bank, in Glacier County. The siting of the proposed route alternatives attempted to minimize impacts to Hutterite colonies and residential clusters. In addition, all project facilities, including poles and access roads will be installed, to the extent feasible, along the edges of property.

d. *MFSA-2, 3.1.1d – On rangeland rather than cropland and on non-irrigated or flood irrigated land rather than mechanically irrigated land.* Siting of the three alternatives was undertaken with the goal of being consistent with the criteria of placing structures on rangeland or non-agricultural land instead of cropland. Where cropland impacts may be unavoidable, the goal became to site alternatives on non-irrigated cropland instead of irrigated cropland. The importance of this goal is underscored by stakeholder consultation which showed concern over potential impacts to cropland (navigation of implements around structures) and impacts to irrigation systems.

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Within the overall project area, land use impacts would primarily be related to agricultural practices, given the predominance of cropland found (primarily non-irrigated) throughout the area. The three alternative routes were delineated in such a way as to avoid all current occurrences of pivot irrigation systems. In addition, emphasis was placed on avoiding locations that would require construction of diagonal systems which would increase the number of guy wires and overall area of impacts.

Selecting locations with consideration given to the land use priorities identified by impacted landowners would minimize long-term impacts along any chosen route. Right-of-way agreements would be negotiated with landowners with the knowledge that land use would be affected and any proposed irrigation systems would need to be redesigned or relocated. Potential impacts to grasslands and riparian vegetation from construction, operation, and maintenance of the proposed transmission line would be mitigated or avoided using the measures summarized in **Section 5.3**.

f. MFSA-2, 3.1.1f – In geologically stable areas with non-erosive soils in flat or gently rolling terrain. The majority of soils within the entire project area are categorized as highly susceptible to erosion, and the topography of the area generally consists of level to rolling high plains bisected by channels cut by rivers, coulees, and creeks. A main consideration in the selection of the three alternatives within this larger project area was to avoid any localized areas of particularly steep slopes and highly eroded topography where possible. Specifically the criteria considered in siting alternatives included avoidance of areas that would show significant constraints to reclamation activities. Areas containing two or more constraints (i.e. highly erodible soil, steep slopes, shallow bedrock, or cretaceous shale), as discussed in detail in Section 4.4, were determined to have severe reclamation constraints, while areas containing none, or only one of these constraints were considered to have no or only minor reclamation constraints. The alternatives chosen all were sited so that a majority of each line would either have no constraints or minor to moderate reclamation constraints (see Table 4.4.6). Areas of severe reclamation constraints were generally avoided. This included a specific emphasis on avoiding the rugged landscape along the Marias River south of Shelby (the Marias River "breaks" area) as well as the Kevin Rim area along the northeastern portion of the Project Study Area.

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g. MFSA-2, 3.1.1g - In roaded areas where existing roads can be used for access to the facility during construction and maintenance. The goal is to minimize the construction of new access roads in roaded areas by being consistent with the criteria of utilizing existing roads for construction and maintenance

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The entire project area has fairly flat topography and is dominated by agricultural land uses and associated public and private roads. Siting of the three alternatives was made so that a majority of the Project RoW would be easily accessed from public roads, existing two-track routes, and farm fields allowing truck and equipment travel along the RoW. Specific areas within the entire project area which will pose difficult access, no matter which alternative is chosen, include sites near the Marias and Teton River crossings. Grading and re-contouring may be required in these potentially difficult construction sites to gain access to reinforced structures that would support wire spans of these crossings. In general, the more westerly routes crossed the Marias and Teton where the width of the river valley was shorter and where there were fewer areas affected by slumping and erosion. However, MATL anticipates thorough restoration efforts in coordination with landowners and appropriate agencies to address any obstacles to access.

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For alternative siting purposes, construction staging areas (e.g., primary sites for unloading equipment and materials for construction) are proposed to be located at practical sites near project area communities of Cut Bank, Valier, Conrad, Brady, Dutton and Great Falls. Regardless of the alternative chosen, construction staging areas would be located in communities near the right-of-way where rail and truck service are available or in rural areas where equipment could be unloaded from tractor-trailers. Efforts will be made to utilize previously disturbed areas such as rail yards, siding areas, construction yards and fallow lots whenever possible. In all cases, construction staging areas would be located on private land and would be subject to landowner negotiations and agreements. Each staging area site would likely be thereabout 5 acres in size.

Smaller construction staging areas would be located in rural areas between communities. In general, these smaller sites would occur approximately every 20 miles along the sited alternatives and would average less than one acre in size. However, due to the frequency of communities within the Project Study Area, few smaller construction staging areas would be needed.

h. MFSA-2, 3.1.1h - So that structures need not be located on a floodplain. Siting of project alternatives was made with the goal of avoiding all impacts to floodplains. Specifically, the goal was to avoid the placement of structures (and any related construction impacts) within a regulatory floodplain and/or below the ordinary high water mark. All three alternative sitings can meet this goal.

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Given the rural nature of the project area, much of the land that would be crossed does not fall within a regulatory floodplain, as identified by the National Flood Insurance Program (NFIP). In addition, given the necessary north-south pathway of the proposed transmission line and the east/west direction of many streams and rivers within the project area, floodplains within the larger project area can generally be bisected rather than paralleled. The typical span between poles makes it feasible to cross flood-prone areas in a single span, without impacting the floodplain itself. Significant river crossings include the Marias River and the Teton River.

Glacier County currently participates in the NFIP and has regulatory flood mapping for its section of the proposed Project Area. Between the Canadian Border, south towards Cut Bank the landscape is peppered with occasional prairie potholes and small tributaries with fairly narrow mapped floodplains. All mapped floodplains, including prairie potholes will be avoided.

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The unincorporated area of Pondera County, while a participating community in the NFIP, does not have Flood Rate Insurance Maps (FIRMs) on record. The unincorporated area of Toole County also participates in the NFIP, but has been identified by FEMA as a No Special Flood Hazard Area (NSFHA). Therefore, the Marias River has not been mapped by the NFIP in either Pondera or Toole County.

Though Pondera County and Toole County do not have regulatory floodplains as defined by the NFIP, the goal remained to site line alternatives so that sensitive flood-prone areas could be spanned without creating impacts. This includes the Marias River "breaks" area south of Shelby given the greater potential for erosion, steep slopes and inaccessible terrain in this area. The three alternatives span the Marias River upstream (to the west) of the "breaks" area without impacting its floodplain.

Teton County participates in the NFIP and has regulatory floodplains along the Teton River. As alluded to above, this floodplain will be bisected rather than paralleled given the lines follow a north-south pathway. While crossing the Teton River is unavoidable, the three alternatives were sited so that the Teton River floodplain will be crossed in a single span. No specific floodplain crossings were identified in Cascade County for any of the three routes.

i. MFSA-2, 3.1.1i – Where the facility will create the least visual impact. In siting the three alternatives within the project area, consideration was given to both visual/scenic quality as well as the sensitivity of the entire project area. The majority of the project area is represented by Class C landscape or an area of "Common Scenic Quality". The areas of Class B landscape within the project area ("Above Average Scenic Quality") include the Marias River Corridor, Teton River Corridor, and the Kevin Rim. Areas identified as having higher sensitivity are those where the transmission line would be placed within a mile of highways, recreation sites and residential areas. Major travel routes that were considered include: Interstate 15, U.S. Highways 2 and 87, and Montana State Highway 44. More detailed information can be found in Section 4.6.4.

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The goal was to site the three alternatives where visual impacts would be low to moderate (low/medium sensitivity areas and generally Class C landscape) along the majority of each alternative. Where avoidance of above average scenic quality (Class B) was impossible, the goal became to avoid areas of particularly higher sensitivity.

Specifically, the three alternatives were sited to avoid the Kevin Rim area completely, and were sited to minimize the visual impacts to above average scenic quality areas. For instance, the Marias River Corridor and Teton River Corridor fall within Class B areas inside the Project Study Area. While crossing these corridors was unavoidable given the north/south orientation of the transmission line and the east/west orientation of the corridors, siting decisions aimed to avoid crossing these features within view of the most widely utilized transportation corridor in the Project Study Area; Interstate 15. The proposed alternatives all cross miles to the east of Interstate 15's viewshed of the Teton River Corridor and miles to the west of Interstate 15's viewshed of the Marias River Corridor. While each alternative is within the visual foreground of a number of individual residences, the alternatives were sited so they did not fall within .25 miles of any existing residential clusters.

j. MFSA-2, 3.1.1j – A safe distance from residences and other areas of human concentration. Health and safety are important factors to consider when siting potential routes. To consider these factors, MATL had evaluations of health and safety impacts completed by its primary engineering design contractor (SNC-Lavalin) to provide guidance for safe siting decisions within the project area, and identify sufficient distances for parallels with existing pipelines and railroad

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tracks. See Section 4.6.5 for more information. Based on SNC-Lavalin's evaluations, the three alternatives were sited in order to be consistent with criteria required to be a safe distance from residential developments, schools, residences and other public meeting places in terms of (1) noise levels, (2) exposure to electric and magnetic fields, (3) and potential for voltage induction.

Noise Levels: Exceedance of ambient noise levels at sensitive receptors (e.g., residences) could result in a noise impact. Therefore siting of the transmission line alternatives and associated transformers was considered based on the audible noise levels calculated for the edge of the proposed safety zone, as well as proximity to sensitive receptors including residential developments, individual occupied residences, churches, schools, and other public meeting places.

As discussed in more detail in Section 4.6.5, SNC-Lavalin calculated that Audible Noise (AN) levels of 46.23 dBA, and 49.56 dBA would be expected at distances of 100 feet, and 52.33 feet (edge of safety zone) from the proposed project centerlines of each alternative, respectively. While there are no design-specific regulations to limit audible noise from transmission lines in the state of Montana, other relevant work such as Bonneville Power Administration (BPA) design criterion for corona-generated AN (L50, foul weather) is 50 +/-2 dBA at the edge of the RoW (BPA, 1982).

Potential noise impacts resulting from operation of the proposed project along any of the three identified alternatives would be negligible based on safety zone distances, comparisons to current specific noise sources and ambient noise levels, and available mitigation measures.

Electric/Magnetic Fields: Although MATL could find very little information indicating that emf causes health problems, impacts on safety and health were considered in siting alternatives. Efforts were made to avoid sensitive areas that could have demonstrated adverse health effects resulting from increases in electric and magnetic fields in the area. Specifically, the three alternatives were sited to avoid urbanized areas completely, provide an adequate safety zone for residential developments (no residential developments within .25 miles of any alternative) as well as minimize exposure to individual occupied residences, churches, schools, and other public meeting places.

As Section 4.6.5 details, SNC-Lavalin calculations using the Corona software program (Kingery, 1991) indicate electric and magnetic field strengths of approximately 1.5 kV/m and 69.37 mG, respectively, at the edge of the proposed safety zone of 52.33 feet. The electric and magnetic field strengths at the proposed Right of Way (22.47 feet) are approximately 5.871 kV/m and 248.76 mG, respectively.

For comparison sake, the electric field general guidance standard of 1 kV/m that has been recommended, but not formerly adopted by the State of Montana for residential areas, is met at a distance of approximately 60 feet from center line. Other recommended guidance available presents less stringent standards. The American Conference of Governmental Industrial Hygienists (ACGIH) has developed reference standards for occupational exposure to electric field and magnetic field effects of 25 kV/m, and 10,000 mG, respectively (ACGIH, 2003). In addition, the Institute of Electrical and Electronics Engineers (IEEE) has recommended standards for both residential and occupational exposure to electric field and magnetic field effects. These are: Electric Field = 5 kV/m (residential), and 20 kV/m (occupational); Magnetic Field = 9000 mG (residential), and 27,100 mG (occupational).

These calculated electric and magnetic field strengths at the edge of the safety zones of each alternative fall well below recommended levels when directly compared to those recommended

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for residential and occupational exposure by the IEEE and ACGIH, and are comparable to recommendations made by the State of Montana.

Potential for voltage induction: Another siting consideration related to maintaining a safe distance from residences and other areas of human concentration relates to the potential for voltage induction. When a conducting object, such as a vehicle or person, is placed in an electric field, currents and voltages are induced in that object. Voltage induction and creation of currents in long conducting objects such as fences and pipelines could be possible near the proposed transmission line. These induced currents and voltages represent a potential source of nuisance shocks near a high voltage transmission line. Therefore, voltage induction was considered in the siting choices made for each alternative.

To aid in siting these three alternatives, MATL authorized a preliminary study to analyze the inductive effects on paralleling linear facilities caused by a 230-kV transmission line in the project area when operating under steady state and single line to ground fault conditions. The purpose of the study was to assist in making an assessment for route selection purposes only, regarding the consequences of some fairly long parallels between potential power line routes and existing pipelines, and railroad tracks. The resulting selection of the three alternatives for the power line did not necessarily eliminate all parallels but it did allow sufficient distance so that anticipated induced voltages could be kept at manageable levels when mitigation strategies were utilized.

k. MFSA-2, 3.1.1k – In accordance with applicable local, state, or federal management plans when public lands are crossed. The overall project area contains about ten percent public lands. Of these public lands, the majority are managed by the Montana Department of Natural Resources and Conservation (DNRC), Bureau of Land Management (BLM), and U.S. Fish & Wildlife Service (FWS). The locations identified for the three alternatives will cross between four and seven percent public lands, respectively.

A majority of the public lands located around these three alternatives are state lands (DNRC school trust parcels). All three alternatives were sited to avoid sensitive areas such as national wildlife refuges, state wildlife management areas, and wildlife habitat protection areas. Specific locations that were avoided in the alternative siting process include Benton Lake National Wildlife Refuge, Kevin Rim, and several waterfowl production areas. In particular, the three alternatives were sited so they were not within a mile of the eastern boundary of the Benton Lake NWR, and are located several miles to the west of Kevin Rim. In addition, the three FWS waterfowl production areas (WPAs) were completely avoided. One WPA is located approximately 6 miles west of Benton Lake, one is located approximately 12 miles northwest of Benton Lake, and one is located approximately 15 miles northeast of Cut Bank.

Final siting decisions on any impacted public lands will require acquisition of permits from the responsible state or federal agency for rights-of-way or easements, and will require compatibility assessments with these agencies to ensure that localized routing decisions are done so in accordance with the relevant Resource Management Plans and management documents. In terms of the DNRC school trust parcels, MATL would coordinate with the Real Estate Management Bureau of DNRC's Trust Land Management Division, given they are responsible for processing applications for rights-of-way and easements across surface lands and navigable waterways administered by the state. MATL would seek rights-of-way permits for crossing BLM managed land if necessary and would coordinate with the BLM Lands and Realty office to seek approval following Resource Management Plan compatibility assessment and National Environmental Policy Act review process. In addition to fee-own public lands, areas covered by

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conservation easements, including the FWS wetland easements and Farm Service Agency's (FSA) Conservation Reserve Program will require that MATL seek compatibility review by these respective agencies on specific parcels to ensure compliance with the terms of the easements.

Overall, the three alternatives chosen within the project area are believed to strike a balanced relationship of addressing the most relevant preferred location criteria as discussed above, while also meeting MATL's general objectives of minimizing project distance/cost, avoiding Blackfoot Reservation land, taking into consideration the siting routes in southern Alberta, and considering potential wind energy development around the Cut Bank area.

4.3.3 No Action

Under the no action alternative, the proposed Project would not be implemented. Existing electrical transmission service in southern Alberta and north-central Montana would be maintained and operated at its current level. In addition, development of potential sustainable generation resources would likely not occur.

4.3.4 Alternatives Considered But Dismissed From Detailed Study

As previously indicated in *Section 2.0*, during the conceptual phase of the proposed Project, MATL considered several alternative routes for the proposed transmission line between Lethbridge, Alberta, and Great Falls, Montana. The alternatives briefly described herein, were dismissed by MATL for further consideration based on numerous factors associated with feasibility and constructability of the proposed Project. **Figure 4-1** depicts these dismissed alternatives.

Northwest Alternatives

Route selection from the U.S./Canada border to Cut Bank 25 miles south required MATL to consider several alternatives. The border crossing location directly north of Cut Bank is largely driven by routing in southern Alberta. Routing in this area follows the west edge of protected lands in the Milk River Hills, one of the largest contiguous grasslands in Canada. MATL discarded several alternatives in this area, except the three presented in this document, based on land use criteria such as: avoidance of occupied residences, an abundance of prairie pothole wetlands, and avoidance of Blackfeet Reservation land.

Eastern Alternative

MATL conceptually considered a Canada/U.S. border crossing near the Coutts/Sweet Grass Port-of-Entry along U.S. Interstate Highway 15 (I-15). Route alternatives considered in this vicinity would parallel Highway 4 from Lethbridge to Coutts/Sweet Grass, and roughly follow I-15 from the border south to Shelby. This alignment would have afforded the project an opportunity to maintain infrastructure development in a common corridor, and as well as avoiding protected lands in the Milk River Hills of southern Alberta.
Figure 4-1

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South of Shelby, the eastern alternative would have traveled diagonally cross-country to the southeast for a distance of approximately 12 miles before heading directly south for almost the entire remaining distance to its tie-in at NWE's 230-kV substation north of Great Falls. Several factors contributed to MATL's dismissal of the eastern alternative including:

- In southern Alberta, the proposed Project would potentially compromise the safety control system on the rail line that parallels Highway 4.
- Land development patterns in southern Alberta, and in the Shelby area would necessitate the use of a stairstep-like centerline resulting in increased distances, and numerous guy wire locations because of deflection angles exceeding one degree.
- The topographically rugged "breaks" of the Marias River occur approximately 6 miles south of Shelby. The steep and highly eroded topography at this crossing location is relatively wide (approximately 6 to 7 miles) and would result in additional project costs to meet engineering challenges.
- The Marias River breaks area is relatively undisturbed which presents the potential for a greater number of archaeological sites.

Cut Bank to Shelby Alternative

MATL considered a cross-country northwest/southeast trending route alternative between Cut Bank and Shelby. This approximately 18+ mile (29-kilometer) alternative would present some of the same difficulties south of Shelby as those associated with the *Eastern Alternative*. In addition, the greater distance related to this alternative would cost approximately $116,400 per kilometer (includes conductor, construction, and structural costs) or approximately an additional $3.376 million in total. Furthermore, a new substation at Shelby would be estimated to cost about $6 million. As a result, MATL discarded the Cut Bank to Shelby Alternative because of increased engineering requirements and land requirements resulting in elevated project costs in comparison to other potential alternatives.

NWE 115-kV Transmission Line Rebuild Alternative

Consolidation of utility corridors and actual facilities would minimize potential environmental impacts resulting from a greenfields project. With that impetus, MATL considered rebuilding and updating as necessary NWE's existing 115-kV transmission line between Cut Bank and Great Falls and engaged in confidential discussions with NWE to that end. This option proved prohibitive based on the logistics of maintaining service, and the economics associated with a partnership and existing line rebuild. Ultimately though, consideration of this alternative resulted in alternatives roughly paralleling NWE's existing line that MATL has carried for further consideration in this proposal (Preferred A and Alternative B).

4.3.5 Land Requirements

Resource-by-resource assessments of potential impacts consider land requirements that are dependent on MATL's project design and construction practices that would be implemented for the proposed Project. As a basis for individual resource discussions that identify potential *Environmental Consequences* and associated mitigations to minimize or eliminate those consequences, brief discussions are provided of basic project components that could result in potential disturbance. These include right-of-way requirements including safety and operation zones, access roads, staging areas, and basic project components. Table 4-1 provides a

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This section describes three proposed Project route alternatives, the no action alternative, and route alternatives that MATL considered but dismissed from detailed study during the conceptual phase of the project. MATL developed the alternatives presented and assessed in this MFSA Application based on anticipated potential impacts or issues, and input provided by the public, regulatory agencies, and non-governmental organizations during pre-application informational meetings and consultations. ¶
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Alternative Routes

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summary of anticipated land requirements associated with each of these project components on an alternative route basis. Design, construction, and implementation of these components are discussed in detail in *Section 5.2 System Design and Implementation*.

4.3.5a Right-Of-Way (RoW)

MATL developed RoW widths for the proposed Project based on structure type, location, proven construction methods, and safety and operations zones. Power line easement requirements are dependent on structure widths. The Project would predominantly employ the use of H-frame structures with three-pole structures used at medium and heavy angles, and dead ends. When angle-bracing wires are used, additional easement space would be required. All angle structures at deflection points are subject to guy wire bracing. All are essential to the Project and are used to address the topography the line is crossing and/or land use practices in the Project Study Area.

The proposed Project would have a left and right side safety and operations zone. The width of this zone is based on safety considerations associated with line to ground short-circuiting, and operations land access needs for line repairs and maintenance activities of the power line. In some situations, the safety zones are also designed to address high wind speeds, which can cause the line to swing away from structures, thus increasing the width of the safety zone.

4.3.5b Access Roads

As a result of relatively flat topography and associated agricultural land uses that predominate in the Project Study Area, MATL anticipates only minimum development of access roads to construct, operate, and maintain the proposed Project. The majority of the Project RoW would be easily accessed from public roads, existing two-track routes, and farm fields allowing truck and equipment travel along the RoW. MATL does not anticipate maintenance of these access points with the exception of gate installations at key locations if necessary. Disturbances resulting from access requirements would be reclaimed to conditions similar to what existed pre-project or to those conditions specified by landowners during easement-lease negotiations. Obstacles to travel along the RoW would potentially include:

- Slopes greater than 5 percent forcing the contractor to consturct temporary access roads.
- Coulees or intermittent stream channels.
- Live streams, rivers, or other wetland areas.
- Areas determined to exhibit reclamation constraints because of highly erodible soils.
- Areas determined to provide habitat to sensitive wildlife or plant species.
- Pipelines, railroad tracks, irrigation ditches, or other linear features.
- Heritage or archeological sites.

Specific areas along route alternatives identified as posing difficult access include sites near the Marias and Teton river crossings. See **Appendix J** for a preliminary overview of access route locations in these areas. Grading and recontouring may be required in these potentially difficult construction sites to gain access to reinforced structures that would support wire spans of these crossings. However, MATL anticipates thorough restoration efforts in coordination with landowners and appropriate agencies. MATL expects that other specific sites would be identified and addressed in subsequent reclamation plans as system design and associated access planning proceeds.

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4.3.5c Construction Staging Areas

Construction staging areas would be located in previously disturbed areas such as rail yards, siding areas, construction yards and fallow lots whenever possible. Some construction staging areas may be located in undisturbed greenfields when disturbed sites are not available. In general, construction staging areas would be located in communities near the right-of-way where rail and truck service are available or in rural areas where equipment could be unloaded from tractor-trailers. In all cases, construction staging areas would be located on private land and would be subject to landowner negotiations and agreements.

Regardless of the alternative route, construction staging areas would likely be located in the following communities at practicable sites:

Cut Bank
Valier
Conrad
Brady
Dutton
Great Falls

Construction staging areas (or marshaling yards) in these communities would be primary sites for unloading equipment and materials for construction. Each site would likely be between two and three acres.

Smaller construction staging areas would be located in rural areas and may be in undisturbed greenfields. In general, these smaller sites would occur approximately every 20 miles along the alternative routes and would average less than one acre in size. However, due to the frequency of communities within the Project Study Area, few smaller construction staging areas would be needed. Currently, the only potential locations occur on Alternative C at two sites:

North of the Teton River near West Knob;
South of the Teton River between Benton Lake NWR and Antelope Flat.

Assuming that the construction staging areas located in the above communities are common to each alternative, the total approximate acreage that would be disturbed due to these sites is listed below:

Alternative A: 15 acres;
Alternative B: 15 acres;
Alternative C: 20 acres.

Based upon construction requirements for structures, access roads, and staging areas, a summary of the approximate land requirements and acreage needs for each alternative is presented below in **Table 4.3-1**.

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TABLE 4.3-1 SUMMARY OF ANTICIPATED LAND REQUIREMENTS[1] MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
Component	**Number**	**Width or Area Construction/Operational**	**Total Acreage**
Preferred A (Approx. length = 130 mi.)			
H-frame	1,040	75 ft^2 (0.0017 acres)	1.8
H-frame light angle	20	215 ft^2 (0.0049 acres)	0.10
3-pole medium to heavy angle	22	385 ft^2 (0.0088 acres)	0.19
3-pole dead end	5	1560 ft^2 (0.036 acres)	0.18
Pulling/tensioning sites	65	10,000 ft^2	14.9
Greenfield staging areas	6	2.5 acres	15.0
Access road total area[2]	3 miles	14 feet wide	5.1
Approximate Total Acreage Preferred Alternative A			37.3
Alternative B (Approx. length = 124 mi.)			
H-frame	992	75 ft^2 (0.0017 acres)	1.7
H-frame light angle	15	215 ft^2 (0.0049 acres)	0.07
3-pole medium to heavy angle	18	385 ft^2 (0.0088 acres)	0.16
3-pole dead end	5	1560 ft^2 (0.036 acres)	0.18
Pulling/tensioning sites	62	10,000 ft^2	14.2
Greenfield staging areas	6	2.5 acres	15.0
Access road total area	5 miles	14 feet wide	8.5
Approximate Total Acreage Alternative B			39.8
Alternative C (Approx. length = 136 mi.)			
H-frame	1,088	75 ft^2 (0.0017 acres)	1.9
H-frame light angle	16	215 ft^2 (0.0049 acres)	0.08
3-pole medium to heavy angle	18	385 ft^2 (0.0088 acres)	0.16
3-pole dead end	6	1560 ft^2 (0.036 acres)	0.22
Pulling/tensioning sites	68	10,000 ft^2	15.6
Greenfield staging areas	8	2.5 acres	20.0
Access road total area	3 miles	14 feet wide	5.1
Approximate Total Acreage Alternative C			43.1

1 – Based on average of 8 tangent structures per mile, angle and dead end structure estimates based on interpretation from maps.
2 – Constructed access road estimates based on minimal need in areas of steep terrain only.

4.4 Physical Resources

An overview of the physical resources found within the Project Study Area is presented below following direction of *Circular MFSA-2, 3.4.1.h-k, s, u, v*. In addition, a detailed baseline discussion of each alternative is included in each section per *Circular MFSA-2, 3.7.8.a-c*.

4.4.1 Geology and Soil

The following discussion describes geology and soils in the Project Study Area. This discussion includes a description of general topography, subsurface geologic units, seismic activity, and soil types.

Overview

The topography of the Project Study Area consists of nearly level to rolling high plains that are bisected by channels cut by rivers, coulees, and creeks. Areas of rugged topography typically occur as narrow bands along two types of features: channel cuts with steep walls, and topographic highs (such as ridges) with steep walls.

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<#>¶
<#>The three route alternatives (Preferred A, Alternative B, and Alternative C) cross the U.S./Canada border approximately 26 miles almost directly north of Cut Bank, Montana and run parallel south to a location approximately 2 miles north of Cut Bank where they converge to skirt the community to the east and south. At the Glacier Electric Cooperative substation, located approximately 1 mile west of Cut Bank, the alternatives diverge traveling over roughly parallel routes east of the Blackfeet Indian Reservation along a southeastward trend. Routes A and B roughly parallel NorthWestern Energy's (NWE) southeastward trending 115-kV line along its entire distance to its tie-in to NWE's 230-kV substation north of Great Falls. Alternative C traverses to the east away from routes A and B at a location approximately 9 miles southeast of Brady, Montana and approximately 5 miles north of the Teton River. Alternative C jogs directly east and south to take advantage of existing north-south and east-west state highway and county road rights-of-way enroute to NWE's 230-kV substation. Major river crossings include the Marias River, approximately 10 miles south of Cut Bank, and the Teton River, approximately 14 miles south of Brady, Montana. Although several state highways are crossed by the three alternatives, only one crossing of Interstate Highway 15 occurs along each of Preferred A, Alternative B, and Alternative C. Detailed discussions of resources encountered and/or potentially affected along each of the three alternatives are provided in the following sections of the application. Finally, in accordance with the route selection process established in *Circular MFSA-2*, the application rationalizes the sele ... [3]

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Steep slopes can typically be found along the major drainages within the Project Study Area, including Buckley Coulee, the Marias River, the Dry Fork of the Marias River, and the Teton River. In addition, steep slopes are also found along the Kevin Rim, an 11-mile long south-to-north trending ridge located in the northeastern portion of the Project Study Area. **Figure D-2-North** presents an overlay of the slope class over the northern half of the Project Study Area, divided into three classes: <15%, 15% - 30%, and >30%. From this overlay it can be seen that the majority of the steep slopes are located along the Kevin Rim and along the Marias River and its tributaries. Figure D-2-South presents the slope classes for the southern half of the Project Study Area. Steep slopes in the southern half are located primarily along the Teton River and its tributaries.

The subsurface geologic units present in the Project Study Area consist primarily of Cretaceous sandstones and shales that represent alternating sequences of marine and continental material deposited during advances and retreats of an inland sea from 65 to 135 million years before present (Alt and Hyndman 1986; and USDA Soil Survey of Toole County 1990). In addition, glacial activity has deposited a thick layer of glacial debris from the Pleistocene era over the Cretaceous bedrock units. In areas that have experienced uplift or erosion, the underlying bedrock units have been exposed at the surface (such as along the Kevin Rim).

Within the glacial debris widely scattered blocks of granite and gneiss can be found. These blocks were carried from Canada by the glaciers. The southern portion of the Project Study Area includes the former floor of Glacial Lake Great Falls, which was present as recently as 15,000 years ago during the Pinedale ice age (Alt and Hyndman 1986). The northern portion of the Project Study Area includes the eastern portion of the former floor of Glacial Lake Cut Bank, which occupied a large area in and around the present day town of Cut Bank. Low hummocky hills that represent glacial moraines can be found throughout the Project Study Area.

Information available from the United States Geological Survey (USGS), National Earthquake Information Center indicates that the Project Study Area has not been seismically active, although there have been some minor occurrences of low magnitude earthquake activity within the area. Based on fault maps available from the USGS, there are no faults located within the Project Study Area. The nearest faults are the South Fork Flathead Fault and two small unnamed faults near Sweet Grass Hills, located to the west and east of the Project Study Area, respectively (USGS Web site). Therefore, no faults are shown on the overlay figures within the Project Study Area.

Soils in the Project Study Area are characterized by clays, clay loams, silty clay loams, and sandy loams that occur on glacial moraines, stream and lake terraces, and dissected shale or sandstone uplands (Haigh et al. 1980). Soil erosion data were obtained from the Natural Resources Conservation Service (NRCS). A majority of the soils within the Project Study Area are categorized as highly susceptible to erosion (Figures D-2-North and D-2-South).

Baseline

The following discussion describes soils and geology along the three alternative routes, as well as a direct comparison between the two northern border alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative). Table 4.4-1 lists the specific information addressed in the Baseline section as required by *Circular MFSA-2* and the corresponding baseline overlays. Refer to Section 2.2 for an explanation of the information requirements that were dismissed. The information requirements include mapping and evaluation of the following:

Highly Erodible Soils (including soils prone to wind and water erosion):
- Soils occurring on steep slopes
- Soils subject to mass movement

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Reclamation Constraints Including:
- Highly Erodible Soils
- Steep Slope
- Shallow depth to bedrock

Areas Underlain by Cretaceous Shale Parent Material

TABLE 4.4-1 SOILS AND GEOLOGY INFORMATION REQUIREMENTS AT BASELINE LEVEL MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
MFSA-2 Section	**Information Requirement**	**Baseline Overlay**	**Impact Zone (miles)**
3.4.1k, 3.7.7a, 3.7.8a	Highly Erodible Soils/Wind and Water Erosion Risk	Hydrogeology	1
3.4.5	Slope Classification	Hydrogeology	1
3.4.1w, 3.7.7a	Active Faults	Hydrogeology	1
3.7.8c	Reclamation Constraints	Hydrogeology	1

4.4.1a Highly Erodible Soils

The following includes a discussion of areas along each route determined to contain highly erodible soils. Highly erodible soils include those soils prone to wind and water erosion. Areas along each alternative route containing highly erodible soils are identified in **Figures E1-b** through **E14-b**. In addition, **Table 4.4-2** indicates the length, in miles, of highly erodible soils for each alternative route. This table also provides a direct comparison between the two northern alternative segments: the Western Alternative Segment and the Eastern Alternative Segment (which is part of the Preferred Alternative).

TABLE 4.4-2 LENGTH OF EACH ALTERNATIVE CROSSING HIGHLY ERODIBLE SOILS MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT				
Alternative	**Highly Erodible (Miles)**	**Not Highly Erodible (Miles)**	**Unknown/Water (Miles)**	**Total (Miles)**
A	111.71	11.14	7.04	129.89
B	107.85	11.53	5.04	124.43
C	113.27	22.25	.97	136.49
Western Segment Alt	*17.53*	*.97*	*0.0*	*18.50*
Eastern Segment Alt	*15.17*	*3.09*	*0.15*	*18.41*

4.4.1b Steep Slopes

While the majority of each route contains highly erodible soil, most of area along each route contains slopes of less than 15 percent (**Table 4.4.1-3**). This factor likely lessens the degree of actual erosion potential along each alternative route.

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TABLE 4.4-3 LENGTH OF EACH ALTERNATIVE CROSSING AREAS >15 PERCENT SLOPE MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT				
Alternative	**<15 Slope (Miles)**	**15-30 Slope (Miles)**	**>30 Slope (Miles)**	**TOTAL (Miles)**
A	125.70	3.87	0.32	129.89
B	121.90	2.41	0.12	124.43
C	132.84	3.12	0.52	136.49
Western Segment Alt	*17.78*	*0.68*	*0.04*	*18.50*
Eastern Segment Alt	*18.22*	*0.18*	*0.00*	*18.41*

4.4.1c Mass Movement

Soils subject to mass movement are relatively uncommon along each alternative route since the majority of the region is currently farmed and contains slopes less than 15 percent. Areas potentially subject to mass movement primarily occur on excessively steep slopes adjacent to the Teton and Marias rivers.

Areas with mass movement potential were determined to host highly erodible soils and slopes in excess of 15-30 percent. These areas primarily occur at the Marias River and Teton River crossings. Remaining portions of the Project Study Area that contain highly erodible soils are relatively level and were therefore determined to have little potential for mass movement.

Figures E-15b and E-16b (see electronic submittal) depict areas along each route with mass movement potential (highly erodible soils with slopes in excess of 15%) at the Teton River crossing. These figures show that Alternative C would cross the greatest and severest areas with mass movement potential. The preferred Alternative A and Alternative B would cross the least areas with mass movement potential. It is anticipated that ground disturbance and construction in areas with mass movement potential can be avoided by spanning the line over steep slopes.

Figure E-17b depicts areas along each route with mass movement potential (highly erodible soils with slopes in excess of 15%) at the Marias River crossing. This figure shows that Alternative C would cross the greatest and severest areas with mass movement potential. The preferred Alternative A and Alternative B would cross the least areas with mass movement potential. In addition, it is anticipated that ground disturbance and construction in areas with mass movement potential can be avoided by spanning the line over steep slopes. Therefore, project activities are not anticipated to cause mass movement of soils, and conversely, if mass movement does occur it is not expected to affect MATL's proposed 230-kV transmission line facility.

4.4.1d Reclamation Constraints

Landscape features presenting constraints to reclamation activities include areas containing highly erodible soil, steep slopes, shallow depth to bedrock, and/or presence of cretaceous shale. Highly erodible soils and steep slopes are discussed above and the relative proportion of these areas along each alternative route is included in Tables 4.4-2 and 4.4-3. Shallow bedrock presents an additional constraint to reclamation and is defined as areas where the depth to bedrock is less than 10 inches. Table 4.4-4 includes the length along each alternative route with shallow depth to bedrock. Cretaceous shale is generally considered a soft parent material

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and soils developing over this bedrock type are subsequently prone to erosion. Table 4.4-5 includes the length of each alternative route that traverses areas underlain by cretaceous shale parent material.

TABLE 4.4-4
LENGTH OF EACH ALTERNATIVE CROSSING AREAS WITH SHALLOW DEPTH TO BEDROCK
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Alternative	Deep Soils - > 10 Inches (Miles)	Shallow Soils - < 10 Inches (Miles)	Total (Miles)
A	111.63	18.26	129.89
B	113.17	11.26	124.43
C	123.86	12.63	136.49
Western Segment Alt	*18.50*	*0.0*	*18.5*
Eastern Segment Alt	*18.41*	*0.00*	*18.41*

TABLE 4.4-5
LENGTH OF EACH ALTERNATIVE CROSSING CRETACEOUS SHALE
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Alternative	Cretaceous Shale (Miles)	Other Bedrock Type (Miles)	Total (Miles)
A	87.33	42.56	129.89
B	78.53	45.9	124.43
C	100.49	36	136.49
Western Segment Alt	*18.5*	*0.0*	*18.5*
Eastern Segment Alt	*18.41*	*0.00*	*18.41*

Areas along each alternative route containing two or more constraints (i.e. highly erodible soil, steep slopes, shallow bedrock, or cretaceous shale) were determined to have severe reclamation constraints, while areas containing none, or one of these constraints were considered to have no or only minor reclamation constraints. Each portion of Alternatives A-C was assigned a value between 0 and 5 depending on the severity of the reclamation constraints for that segment (Table 4.4.-6). Portions of each route containing no constraints were assigned a reclamation constraint value of 0, while portions of each route containing two or more constraints were typically assigned a value of 4 or 5. Areas assigned a value of 4 or 5 are considered to have severe reclamation constraints.

Of specific note, Cretaceous shale is the dominant bedrock type within the Study Area and along each alternative route. However, many areas underlain by cretaceous shale have a gentle slope, are currently cropped, and would not present significant constraints to reclamation. Therefore, only cretaceous shale occurring in areas with a steep slope or where exposed at the surface were considered to have severe reclamation constraints. This is reflected in the formula for calculating reclamation constraints along each alternative route (see Table 4.4-6). The presence of cretaceous shale was considered a factor in determining the reclamation constraints of a given segment along each route.

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TABLE 4.4-6
RECLAMATION CONSTRAINTS ALONG EACH ALTERNATIVE ROUTE
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Alternative	0 – No Constraints (Miles)	1 – Minor Constraints (Miles)	2 – Minor to Moderate Constraints (Miles)	3 – Moderate Constraints (Miles)	4 - Severe (Miles)	5 - Severe (Miles)
A	3.10	41.28	77.85	5.85	1.74	.06
B	7.83	36.88	76.25	2.96	.51	0.0
C	13.74	22.59	93.64	5.45	.99	.07
West Alt Seg.	*0.0*	*.84*	*17.04*	*06*	*.02*	*0*
East Alt Seg.	*0.0*	*3.24*	*14.98*	*0.18*	*0.0*	*0.0*

Preferred Alternative A

The majority of the soils crossed by Preferred Alternative A are considered highly erodible (**Table 4.4-2**). These soils include deep, loamy to shallow sandy soils formed over cretaceous shales that are generally considered to be prone to wind and water erosion. However, only 4.19 miles or 3 percent of Preferred Alternative A occurs on slopes greater than 15-percent (**Table 4.4-3**).

The majority of Preferred Alternative A contains shallow depth to bedrock (Table 4.4-4). In addition, the majority of the geologic units crossed by Preferred Alternative A are classified as cretaceous shale (**Table 4.4-5**). Much of the remainder of the Preferred Alternative A crosses glacial lake and glacial till deposits.

Preferred Alternative A was found to have only 1.8 miles of severe reclamation constraints (**Table 4.4-6**). This is primarily based on a lack of steep slopes along this route. The majority of Preferred Alternative A contains minor to moderate reclamation constraints.

Alternative B

The majority of the soils crossed by Alternative B are considered highly erodible (**Table 4.4-2**). These soils include deep, loamy to shallow sandy soils formed over cretaceous shales that are generally considered to be prone to wind and water erosion. However, only 2 percent of Alternative B occurs on slopes greater than 15-percent (**Table 4.4-3**).

The majority of Alternative B contains shallow depth to bedrock (**Table 4.4-4**). In addition, the majority of the geologic units crossed by Alternative B are considered cretaceous shale (Table 4.4-5). Much of the remainder of Alternative B crosses glacial lake and glacial till deposits.

Alternative B was found to have 0.51 miles of sites containing severe reclamation constraints (**Table 4.4-6**). However, the majority of Alternative B contains minor to moderate reclamation constraints due to a lack of steep topography.

Alternative C

The majority of the soils crossed by Alternative C are considered highly erodible (**Table 4.4-2**). These soils include deep, loamy to shallow sandy soils formed over cretaceous shales that are generally considered to be prone to wind and water erosion. However, only 2.7 percent of Alternative C occurs on slopes greater than 15-percent (**Table 4.4-3**).

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The majority of Alternative C contains shallow depth to bedrock (**Table 4.4-4**). In addition, the majority of the geologic units crossed by Alternative C are considered cretaceous shale (Table 4.4-5). Much of the remainder of Alternative C crosses glacial lake and glacial till deposits.

Alternative C was found to have 1.06 miles of sites containing severe reclamation constraints (**Table 4.4-6**). However, the majority of Alternative C contains minor to moderate reclamation constraints due to a lack of steep slopes.

Eastern/Western Alternative Segments Comparison

The 18.5 mile Western Alternative Segment and the 18.41 mile Eastern Alternative Segment have very similar geologic and soil resources; including similar types and ranges of reclamation constraints.

Environmental Consequences

Soil and geologic resources were found to be highly similar along the three alternative routes. Therefore, the following discussion of environmental consequences resulting from project activities pertains to all three alternatives.

Construction of the proposed facility would require access to each structure location. Most access roads would be restored to pre-existing conditions following construction. MATL would retain key access roads following construction to maintain adequate access to the right-of-way for routine operations and maintenance activities.

Construction of the proposed project has the potential to impact soils in the following ways: increase the potential for wind and water erosion due to clearing of vegetation, reduce crop productivity through compaction and soil mixing, and long term reclamation difficulties.

The primary impacts of the project on soil resources would be erosion from construction activities, compaction, reclamation constraints, and topsoil/subsoil mixing. Soil surface disturbance, compaction, and mixing have the potential to occur across all soil types, and significance of the impact would vary based on the soil properties.

Overhead transmission line construction requires excavation, grading, and possibly soil stockpiling. These disturbances would likely result in some increase to wind and water erosion rates and compaction levels, and result in the relocation of some soil resources.

Construction of the proposed facilities may have adverse impacts due to the properties of the geological units along each of the alternatives. The potential impacts associated with the geological formations crossed by the proposed project include increased reclamation constraints from shallow depth to bedrock and presence of cretaceous shale.

Construction activities that remove vegetation and cause soil surface disturbance have the potential to result in increased erosion. Soils identified as highly erodible are more likely to erode and are linked to site-specific characteristics such as soil type, slope length and steepness, applied measures to reduce impacts, and climatic conditions. The potential for water erosion is associated with rain events or snowmelt. Snowmelt would likely not contribute significantly to potential water erosion. The potential for wind erosion would generally be higher than from snowmelt. Erosion would result in loss of productivity. Soil erosion impacts would be short term in duration with the possible exception of localized severe erosion from rain events.

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Construction activities associated with heavy equipment and operating under wet conditions can cause soil compaction. Rubber-tired vehicles generally compact soils more than tracked vehicles. The severity of compaction depends on soil moisture and soil type. Loam and clay soils tend to compact easier and compaction is more severe when soils are moist to wet. Duration of the impact would depend on compaction severity. Soil compaction would generally be a short-term impact. Severe compaction may have long-term impacts.
Construction activities associated with access road construction, augering, and vehicle rutting may cause topsoil and subsoil mixing. Soil relocation is typically caused by project related construction activities. Soil resources may be directly displaced by construction equipment, although these impacts would be considered negligible. Construction activities that could cause relocation of soil horizons, including road improvements, new access road construction, and pole placement would result in moving soil resources by construction equipment. These effects would not be noticeable in areas of overland construction (i.e., no new access roads). Topsoil stripping by casting aside the topsoil when grading roadway would mitigate any potential concerns. Sidecast soils would be replaced following construction.

Mitigation Measures

Soil impacts associated with construction and operation of the proposed transmission line would be mitigated through use of Best Management Practices adopted by MATL and the Storm Water Pollution Prevention Plan. Applying these measures to reduce impacts would effectively reduce soil related impacts resulting from the Proposed Action. In addition, measures identified in Section 5.3, *Environmental Protection Measures*, would be applied to appropriate areas to reduce impacts to soil resources. Additional measures recommended include sidecasting topsoil during access road construction, then spreading the topsoil over the bladed surface during rehabilitation. Areas determined to have severe, and in some cases even moderate reclamation constraints will be avoided whenever possible. All areas affected by project activities would be appropriately mitigated by timely seeding with native and/or non-invasive seed mixes to prevent erosion. Based on avoidance of sensitive sites, and the use of mitigation measures, it is anticipated that there will be no significant impacts to either soil or geological resources resulting from Project activities.

4.4.2 Air

The following discussion focuses on air quality in the Project Study Area and evaluates any potential impact that could occur from construction or operation of the proposed Project.

Overview

The overall air quality within the study area is generally very good and typically achieves ambient air quality standards. A primary source of air pollution within the study area is the city of Great Falls, which has been designated as a non-attainment area in the past for carbon monoxide (Montana DEQ). In addition, the area near Cut Bank experiences locally high levels of carbon monoxide and nitrous oxides due to emissions from the local oil and gas industry. This area is not, however, designated as a non-attainment area for those two or any other pollutants.

Baseline

There are no measured ambient air quality data for the Project Study Area. However, due to the location and nature of the affected Wind Project areas, it is expected that ambient concentrations will remain well below all Montana Ambient Air Quality Standards and National

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Ambient Air Quality Standards (MAAQS and NAAQS, respectively). Measured ambient air quality data for the areas crossed by the Project are minimal.

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Preferred Alternative A

There are no measured ambient air quality sampling data for areas along the Preferred Alternative A. Due to the largely rural setting of this route and the proposed construction methods, MATL does not anticipate any exceedance of Montana or National Air Quality Standards.

Alternative B

Similar to the Preferred Alternative A, there are no measured ambient air quality sampling data for areas along the Alternative B. Due to the largely rural setting of this route and the proposed construction methods, MATL does not anticipate any exceedance of Montana or National Air Quality Standards.

Alternative C

Similar to the Preferred Alternative A and Alternative B, there are no measured ambient air quality sampling data for areas along the Alternative C. Due to the largely rural setting of this route and the proposed construction methods, MATL does not anticipate any exceedance of Montana or National Air Quality Standards.

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Environmental Consequences

Potential impacts to air quality would be similar for each alternative route. Therefore, the following discussion of environmental consequences applies to all thee alternative routes.

Construction of the proposed project would impact air quality in two ways: fugitive dust and air emissions. Fugitive dust would be caused by the construction equipment associated with travel to and from the right-of-way, clearing, grading, and other earth moving activities. The impacts associated with fugitive dust during construction would be comparable to adjacent agricultural practices and short-term in duration. Fugitive dust would be most severe on soils that are highly prone to wind erosion and along access roads.

Following construction and reclamation, fugitive dust is expected to be negligible and limited to infrequent vehicle traffic accessing the right-of-way for routing operations and maintenance activities. Therefore, the impacts associated with fugitive dust and air emissions are expected to be short-term in nature and similar to normal agricultural practices employed in the Project Study Area.

Operation of construction equipment typically used for transmission line construction would emit pollutants such as: carbon monoxide (CO), sulfur oxides (SOx), particulate matter (PM), nitrogen oxides (NOx), volatile and semi-volatile organic compounds, and carbon dioxide (CO_2). Emissions from construction equipment would be similar to emissions from normal agricultural practices within the project area and would not be expected to have an impact on air quality.
Mitigation Measures

To minimize the short-term impact of windblown dust, MATL would use water trucks to spray roadways and work areas as necessary. In addition, to prevent the long-term impact of wind-blown dust, MATL would reclaim temporary work areas with an appropriate seed mixture based

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on NRCS or county guidance and landowner requests. To minimize the extent of fugitive dust, MATL would use water trucks to spray project areas with the largest potential for fugitive dust. Based on the fact that project activities would not cause an exceedance of air quality standards and that fugitive dust would be mitigated using the above described measures, no significant impacts to air quality would occur.

4.4.3 Water

Both Overview and Baseline conditions for water resources are discussed in the following section, concluding MATL's evaluation of potential impacts, and proposed mitigations in response to those impacts, if necessary.

Overview

The following discussion describes water resources within the Project Study Area. **Table 4.4-7** lists the specific information addressed in the Overview section as required by *Circular MFSA-2* (Montana DEQ 2004) and the corresponding Overview overlays. Refer to *Section 2.2* for an explanation of the information requirements that were dismissed. The information requirements fall under two basic categories including:

- Municipal Water; and
- Streams and Water bodies.

TABLE 4.4-7
WATER RESOURCES INFORMATION REQUIREMENTS AT OVERVIEW LEVEL
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

MFSA-2 Section	Information Requirement	Overview Overlay
3.4.1.h	Municipal Watersheds	Hydrology
3.4.1.i	Class I/II Streams	Hydrology
3.4.1.j	303(d) Streams	Hydrology
3.4.1.u	Waterbodies > 20 ac	Hydrology
3.4.1.v	Potable Surface Water Supplies	Hydrology

Municipal Water

The Project Study Area encompasses portions of three major watershed basins within the state of Montana. The extreme northern portion of the Project Study Area lies within the Milk watershed basin. The north central and central portions of the Project Study Area lie within the Marias watershed basin, and the southern portion of the Project Study Area lies within the Missouri-Sun-Smith watershed basin. Within each of these watershed basins are a number of watershed sub-basins, and each sub-basin may contain one or more municipal watersheds. A municipal watershed is defined as any watershed containing a community water system "that serves at least 15 service connections used by year-round residents of the area served by the system; or regularly serves at least 25 year-round residents (42 U.S.C. 300f (15)). The municipal watersheds within the north half of the Project Study Area are shown on **Figure D-3-North**, and the municipal watersheds within the south half of the Project Study Area are shown on **Figure D-3-South**.

The name of each municipal watershed represents the name of the watershed sub-basin, and the number shown below the name is unique to each municipal watershed. From north to south the Project Study Area includes the following watershed sub-basin names: Upper Milk, Marias,

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Cut Bank, Teton, Sun, and Upper Missouri-Dearborn. For those watersheds that contain a potable surface water source, the location of the potable surface water source is identified by a purple asterisk on each of the overlay figures mentioned above. Most of the municipal watersheds serve as groundwater sources for one or more communities, while some of the municipal watersheds serve as surface water sources. Municipal watersheds that overlap the Project Study Area and which have potable surface water bodies located within them include: Sun Watershed (Muddy Creek), Cut Bank Watershed (Cut Bank Creek), and Marias Watershed (Tiber Reservoir, Lake Francis, and Bynum and Arod [Bynum Reservoir and Arod Lake]). Note that, due to differing sources for the different types of data shown on **Figures D-3-North and D-3-South**, the point source location of the potable surface water shown may not exactly coincide with the location of the water body with which it is associated.

Beneficial Uses of Water

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The Montana Board of Environmental Review, a citizen panel appointed by the governor, establishes water quality standards and designates beneficial uses of rivers, lakes, and streams. Beneficial uses can be grouped into three broad categories:

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- Recreation includes swimming, boating, and other water activities that involve physical contact with water;
- Aquatic life includes the plants and animals that are the basis of a healthy aquatic eco-system. Fisheries are listed as a separate beneficial use due to their recreational and economic importance. Waterfowl and "fur bearers" are also considered beneficial uses; and
- Water supply encompasses domestic, municipal, industrial, and agricultural uses.

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Every water body has designated beneficial uses based on the Montana Water Classification System (MDEQ 2002).

Streams and Water Bodies

The Project Study Area is largely drained by two river drainage basins. The Marias River bisects and drains the northern half of the Project Study Area, and the Teton River bisects and drains the southern half of the Project Study Area. Both of these rivers flow in an easterly direction. To the east of the Project Study Area the Marias turns southeasterly, and the Teton River flows into the Marias just before the Marias empties into the Missouri River. The very southeastern tip of the Project Study Area also contains a short portion of the Missouri River southwest of its intersection with the Marias.

Within the Project Study Area, the only water body identified by the (Montana Fish, Wildlife, and Parks (MFWP) as a blue ribbon or red ribbon river is the Missouri River. The river miles at which all three alternatives cross the Marias and Teton rivers are considered Habitat Class 3 and Sport Class 4 fisheries. Streams within the Project Study Area are represented on **Figures D-3 North** and **D-3-South**. Numerous smaller perennial and/or intermittent streams are also present within the Project Study Area. These include several streams and rivers within the Project Study Area, which are designated as 303(d) or impaired streams. These include (from north to south) Old Maids Coulee, Marias River, Dry Fork Marias River, Pondera Coulee, Teton River, and Lake Creek. The 303(d) streams are represented by a green line on **Figures D-3-North** and **D-3-South**.

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Water quality of all streams/drainages within the Study Area is classified by MDEQ as B-1. Water quality classification is based on Water-Use Classification of the Missouri River Drainage found in Rule 17.30.610 in the Water Quality chapter of the Administrative Rules of Montana. Rule 17.30.623 states that surface waters classified as B-1 are to be maintained suitable for drinking, bathing, recreation, propagation of salmonid fishes, and agricultural and industrial water supply.

The Project Study Area also contains a number of lakes and reservoirs. All surface water bodies with areas greater than 20 acres are presented in blue on **Figures D-3-North** and **D-3-South**. The largest of these water bodies is Benton Lake, which is located in the southeastern portion of the Project Study Area. Benton Lake is actually a 5,000-acre shallow wetland that was created by the last continental glacier (USFWS 2001). Other large lakes include Aloe Lake and Hay Lake, both of which are located north of the Marias River. In addition, there are several large ephemeral lakes within the Project Study Area, located within the northeastern portion near Kevin and Sunburst. Numerous smaller lakes are found throughout the Project Study Area. However, there are also some portions of the Project Study Area that are nearly devoid of lakes, such as the area between Benton Lake and the Teton River.

Two major regional bedrock aquifer systems, the Northern Great Plains Aquifer System and the Northern Rocky Mountains Intermontane Basins aquifer system underlie Montana. The Project Study Area lies entirely within the boundaries of the Northern Great Plains aquifer system, near its western edge. The major aquifers of the Northern Great Plains aquifer system are sandstones of Tertiary and Cretaceous age and carbonate rocks of Paleozoic age. These aquifers, along with regional confining units that separate some of them, form one of the largest confined aquifer systems in the United States (Whitehead 1996). Beneath the Project Study Area, the regional aquifers consist predominantly of Upper Cretaceous sandstones of the Northern Great Plains aquifer system.

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Baseline

The following discussion describes water resources along each of the three alternative routes, as well as a direct comparison between the two northern border alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative). **Table 4.4-8** lists the specific information addressed in the baseline section as required by *Circular MFSA-2* (Montana DEQ 2004) and the corresponding baseline overlays. Refer to Section 2.2 for an explanation of the information requirements that were dismissed. The information requirements fall under two basic categories including:

- Municipal Water
- Streams and Water bodies

TABLE 4.4-8
WATER RESOURCES INFORMATION REQUIREMENTS AT BASELINE LEVEL
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

MFSA-2 Section	Information Requirement	Baseline Overlay	Impact Zone (miles)
3.7.7.a; 3.7.18	Municipal Watersheds; Impacts to surface and ground water quality	HydroGeo	1
3.7.7.a; 3.7.10.h.xiv; 3.7.12.b.xi; 3.7.15.c.x	Class I/II Streams	HydroGeo	1
3.7.9.f	100 Year Floodplains	HydroGeo	1
3.7.17	Perennial Streams	HydroGeo	1
3.7.7.a; 3.7.18	Potable Surface Water Supplies	HydroGeo	1

Data on water resources in the Project Study Area were obtained from a variety of sources, including literature review, reports from the Montana Natural Heritage Program (MNHP),

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Federal Emergency Management Agency (FEMA), Flood Insurance Rate Maps (FIRMs), National Wetland Inventory data (NWI) and data from the Montana Natural Resource Information System. Electronic data was acquired for the Great Falls area. Digitizing from available flood Insurance Rate Maps created the remaining flood information. Data for 100-year flood delineation was not available for the entire Project Study Area. Based on a review of these maps, water resources are similar along each of the alternative routes. The primary surface water features along all three routes include the Marias and Teton River systems, their tributaries, and certain isolated pothole lakes. Groundwater resources are also similar along all three alternative routes and are as described in the Overview section above.

Table 4.4-9 lists the water bodies 20 acres in size or larger that occur along or adjacent to each of the transmission line alternatives.

TABLE 4.4-9
WATER BODIES 20 ACRES IN SIZE OR LARGER ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Water Body	Preferred Alternative A (miles)	Alternative B (miles)	Alternative C (miles)	Western Alt. Segment	Eastern Alt. Segment
PEMA	0.02	--	--	--	0.02
Marias River	0.04	0.06	0.08	--	--
PEMC	0.03	0.06	--	0.02	0.03
PEMA/PEMC	--	0.05	--	--	--
PEMA Wetlands off of Black Horse Lake	--	0.02	0.02	--	--
Black Horse Lake	--	--	--	--	--
L2ABF	--	--	--	--	--
PEMC/L2USA	--	--	--	--	--
PUSA	--	--	--	--	--
PEMB	--	--	--	--	--
PEMAd	.02	--	--	--	--
Total	.51	0.19	0.10	0.02	0.05

Also, to directly compare the two segment alternatives from the Canadian Border south; the Western Alternative Segment crosses 0.02 miles of PEMC, and the Eastern Alternative Segment crosses .02 miles of PEMA and .03 miles of PEMC.

Environmental Consequences

Potential impacts to water resources may occur for all alternatives during construction, operations, and decommissioning of the 230-kV transmission line. FEMA 100-year floodplains are crossed along several links in each alternative. Construction of the proposed project would require ground clearing and grading to create work areas and access roads. Overall, construction and operation of the proposed project could impact water resources through:

- Erosion and sedimentation into water bodies increasing turbidity;
- Stream bank erosion and sedimentation;
- Inadvertent release of petroleum products associated with construction equipment;
- Herbicide use could result in runoff to streams;
- Increased water temperature due to removal of riparian vegetation;
- Impacting existing recreational use of water;
- Impacting aquatic life; and
- Impacting existing agricultural use of water

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Since surface and groundwater resources are largely the same within all three alternatives, potential impacts to surface waters would be similar. Therefore, the following discussion of mitigation measures to be used to offset minor impacts to these resources, apply to all three alternative routes.

Mitigation Measures

The following discussion fulfills the baseline impact assessment requirements as outlined in *Circular MFSA-2*. Where possible these impacts would be reduced or avoided through the implementation of mitigation, avoidance, or environmental protection measures. Environmental Protection Measures are discussed in Section 5.3. Overall, since surface waters will be spanned, and BMP's will be used to minimize construction runoff into streams, no impacts to water resources are anticipated. MATL would adhere to an erosion and sediment control plan that would minimize the potential for sedimentation into water bodies. Strategies that would be included in the plan are maintaining vegetated buffer strips between work areas and water bodies and using erosion control devices when work areas need to be in close proximity to water bodies. To reduce the risk of inadvertent release reaching water bodies, MATL would develop and implement a Storm Water Pollution Prevention Plan. All vehicles would be required to have absorbent materials. As feasible, MATL would maintain the riparian vegetation by keeping a buffer between work areas and riparian areas.

The proposed transmission line is not anticipated to impact the recreational use of waters within the Project Study Area nor is it anticipated to impact aquatic life within the Project Study Area. During project construction, short-term surface water quality impacts would be possible due to disturbance of the soil surface (causing erosion), and/or compaction and possible contaminant introduction. The proposed project could result in a potential indirect, short-term effect for increased sedimentation of adjacent surface waters due to erosion. Such potential effects would be minimized to less than significant levels through utilization of appropriate BMPs for spill prevention and control, pollution prevention, and erosion control measures.

Construction and operation of the proposed transmission line would potentially affect the agricultural use of water (e.g. irrigation). The proposed line would have to cross land under irrigation or with the potential to be irrigated. All current and permitted center-pivot irrigation systems currently within the Project Study Area would be avoided.

Temporary irrigation disruption could occur as a result of transmission line construction, though the proposed fall/winter construction period would totally avoid construction-related impacts to irrigation. MATL will look at a number of ways to avoid or reduce construction-related impacts. Basic mitigation to minimize impacts to agricultural uses is inherent in the final design of the proposed transmission line. During this period, on-going coordination with land owners/irrigators/irrigation districts would occur to identify measures to minimize potential impacts. MATL would also consider design refinements such as minor adjustments in alignment or reduction in right-of-way needs to minimize irrigation impacts.

Operational impacts from the proposed line could include prevention of future development of center-pivot irrigation systems due to the presence of transmission line structures (e.g. poles); limited mobility of metal irrigation pipes underneath electrical lines; and shock hazards from sprinkler streams. Mitigation to minimize operational impacts to irrigation would include coordination with land owners who have plans to develop center pivot irrigation systems in order to avoid those fields if possible. Second, the typical length of irrigation pipes is 30 feet. The shortest allowable distance from the ground to the electrical line would be 19.72 feet. MATL would inform landowners when installing above-ground irrigation systems, to keep pipes

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horizontal so they are not lifted into lines by mistake. Lastly, MATL would inform landowners to adjust spray to avoid shock hazards. Sprinkler streams from an irrigation system should break into droplets as opposed to flowing in a single unbroken stream. An unbroken stream of water that contacts a power line can conduct electricity and cause a dangerous shock (Culverco 2002).

In general, comparisons of impacts between the three alternatives are fairly equal. Alternative A affects fewer miles of land under irrigation than Alternative B or C though all alternatives attempt to minimize the potential disturbance of these agricultural lands. In addition, impacts are expected to be short-term that are temporary in nature. Therefore, based on avoidance of sensitive resources and use of mitigation measures, no significant impacts to water resources are anticipated to occur under any alternative as a result of project activities.

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4.5 Biological Resources

Circular MFSA-2 requires evaluation of biological resources within the Project Study Area that include vegetation, wetlands, wildlife, and special status plant and wildlife species. Assessment of these biological components of the environment are provided in the ensuing sections.

4.5.1 Vegetation

This section addresses the current state of vegetation resources within the Project Study Area (**Figure C-1**) and along the three alternative routes. Vegetation information was acquired from various sources including the Montana Natural Heritage Program (MNHP) and the Montana Natural Resource Information System (NRIS). Agricultural data were obtained from Montana CAMA Dataset, which is updated approximately weekly. Information on land cover type, specifically forest and grassland, was obtained from Montana GAP Analysis data (Fisher et al. 1998), which dates back to 1993. A comparison of the GAP cover type data with ortho-based photographs and field investigations revealed the GAP data to be outdated and inaccurate in some areas. Aerial photos of a portion of the Project Study Area were used to identify mature riparian forests. Cover types and plant communities were identified through field investigations conducted in May, July, and August 2005. The forest and grassland data presented in figures and tables should be interpreted as relative abundance and not absolute values.

Overview

The following discussion describes the vegetation distribution and potential occurrence for various plant species within the Project Study Area. In accordance with *Circular MFSA-2* non-timbered grassland or rangeland [MFSA-2, 3.4.3.g] and forested lands [MFSA-2, 3.4.3.h] will be addressed in the Overview discussion. Figures referenced in the Overview section include the Land Use/Land Cover set of overlays. This set is labeled **Figure D-4-North** and **Figure D-4-South** and contains the following data:

Study Area Boundary
PLSS Grid
Developed Residential/Commercial/Industrial
Populated Areas
Military Installations
Federal/State Managed Land
Cropland by Irrigation Class
Non-Ag Grassland
Non-Ag Forestland

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Open Water
U.S. Bureau of Reclamation Easements
Montana FWP Easements
USFWS Easements
Conservation Reserve Program Easements

The Project Study Area encompasses the following Level IV ecoregions of Montana including: the North Central Brown Glaciated Plains, the Foothill Grassland, and the Milk River Pothole Upland (Woods et al. 1999). The ecoregions are located within the Montana Glaciated Plains subsection of the Northwestern Glaciated Plains ecoregion of the Great Plains physiographic province (Nesser et al. 1997) and are in north central Montana in Cascade, Chouteau, Teton, Pondera, Toole, and Glacier counties. The Northwestern Glaciated Plains ecoregion is a transitional region between the flatter and moister Northern Glaciated Plains and the irregular and dryer Northwestern Great Plains. The western and southwestern boundaries of this ecoregion generally correspond to the limits of continental glaciation (EPA 2004). The ecoregion is generally characterized by level to gently rolling glacial till plains at elevations ranging between 2,500 and 5,000 feet above mean sea level (AMSL). Within this ecoregion, especially in the northern section, is a rather high concentration of semi-permanent and seasonal wetlands, referred to as prairie potholes.

The climate is cold continental with a growing season of approximately 100 to 130 days. The primary native vegetative community in the Northwestern Glaciated Plains ecoregion is grama-needlegrass-wheatgrass short grass prairie (Kuchler 1964; MNHP 2004a). The accumulation of snow on the lee side of swales creates mesic micro sites, thereby affecting the distribution of plant communities in this ecoregion (Jones 2003).

In pre-settlement times, drought, fire, and grazing were probably the major disturbance factors, with fire playing less of a role than in other grassland ecoregions. Today, a large majority of the Project Study Area is either in cropland or grazed by livestock (MNHP 2004a). In addition to agriculture, oil and gas development and the creation of road networks are factors in the Cut Bank area contributing to the disturbance of native grasslands.

Two environmental gradients determine species composition in mixed and shortgrass prairies: increasing temperatures from north to south and increasing rainfall from west to east. With increasing latitude, the shortgrass prairies take on an aspect more similar to mixed-grass such as in this ecoregion, where many cool-season species predominate (Sims 1988). Mean summer temperature is 16°C and mean winter temperature is -10°C. In late summer, moisture deficits occur, due to low precipitation and high evapotranspiration. Mean annual precipitation ranges from 10 to 15 inches, about 20 to 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. In general, this ecoregion has an arid grassland ecoclimate (Primm et al. 2001).

The native grassland communities in the Project Study Area have been highly reduced and fragmented due to agricultural land uses and oil and gas development (Figures D-4-North and D-4-South). In upland communities not converted to dryland farming such as rangeland, coulees, and slopes, the dominant grass communities include grama- (*Bouteloua* spp.) needlegrass (*Stipa* spp.) and wheatgrass (*Agropyron* spp.), and wheatgrass-needlegrass (Kuchler 1964). North of Cut Bank toward the Canadian border where the Foothill Grassland and Milk River Pothole Upland ecoregions exist, the natural vegetation is characterized by blue grama grass, wheatgrass, and, to a lesser extent, Junegrass (*Koelaria* spp.). A variety of shrubs and herbs also occur, but sagebrush (*Artemesia cana* and *Artemesia tridentata*) are most abundant, and on drier sites yellow cactus and prickly pear (*Opuntia* spp.) can be found. Saline

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areas support alkali grass (*Puccinellia* spp.), wild barley (*Hordeum* spp.), greasewood (*Sarcobatus vermiculatus*), saltwort (*Salicornia rubra*) and Pursh seepweed (*Suaeda calceoliformis*). Land that has been converted from dryland farming into the Conservation Reserve Program (CRP; 17.7%) is dominated by wheatgrass (*Agropyron* spp.), alfalfa (*Medicago* spp.), clover (*Trifolium pratense*) and annual weeds (e.g. *Tragopogon dubius*).

Agriculture dominates land use (87.95%) within the Project Study Area and is interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands (**Table 4.5-1**). The Project Study Area is primarily composed of non-irrigated farmland and to a lesser extent irrigated farmland. A more detailed discussion of land use in the Project Study Area is found in *Section 4.6.2*.

TABLE 4.5-1
ACRES OF FARMLAND WITHIN THE PROJECT STUDY AREA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover[1]	Acreage	Percent
Sprinkler Irrigated Farmland	117,189.00	8.07
Other Irrigated	38,319.92	2.64
Non-irrigated Farmland	1,121,580.64	77.24

[1] Source: Water permits submitted to the Montana DNRC and data from computer assisted mass appraisal (CAMA). CAMA is a computer-aided analysis of data describing property characteristics that is used in establishing property values for tax assessment.

Non-timbered grassland or rangeland is predicted by the GAP analysis data to comprise approximately 35.9% of the Project Study Area. Based on field investigations, these habitats (or land cover types) are predominantly located near the Marias and Teton rivers, and within undisturbed coulees and drainages. Forested lands occur as cottonwood gallery forest along the Marias and Teton rivers and, as predicted by GAP analysis, comprise less than one percent of the Project Study Area (**Table 4.5-2**).

TABLE 4.5-2
NON-FARMLAND COVER TYPES WITHIN THE PROJECT STUDY AREA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover[1]	Acreage	Percent:
Mixed Mesic Forest	8.01	0.00
Lodgepole Pine[3]	9.29	0.00
Limber Pine[3]	35.65	0.00
Douglas-fir[3]	524.95	0.04
Rocky Mountain Juniper	683.04	0.05
Mixed Xeric Forest	876.00	0.06
Mixed Broadleaf Forest	1,176.99	0.08
Salt-Desert Shrub/Dry Salt Flats	1,491.39	0.10
Broadleaf Riparian	1,888.45	0.13
Mixed Barren Sites	3,166.73	0.22
Rock	3,648.55	0.25
Conifer Riparian[3]	4,214.40	0.29
Water	5,642.00	0.39
Shrub Riparian	5,987.10	0.41
Ponderosa Pine[3]	8,867.72	0.61
Urban or Developed Lands	9,210.79	0.63
Mixed Mesic Shrubs	10,120.29	0.70
Graminoid and Forb Riparian	12,871.36	0.89
Moderate/High Cover Grasslands	17,578.19	1.21

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TABLE 4.5-2 NON-FARMLAND COVER TYPES WITHIN THE PROJECT STUDY AREA MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT		
Very Low Cover Grasslands	40,969.22	2.82
Altered Herbaceous	68,502.53	4.72
Agricultural Lands – Irrigated[2]	365,465.01	25.17
Agricultural Lands – Dry[2]	426,362.95	29.36
Low/Moderate Cover Grasslands	462,705.25	31.87

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the relative abundance of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

Shrublands are comparatively rare and occupy a very small portion (<1%) of the Project Study Area. These communities tend to be small and isolated, and are generally located in badlands, upland draws, and terraces along riparian zones. The primary upland shrub community throughout the northern portion of the Project Study Area is silver buffaloberry (*Shepherdia argentea*), which occurs as small, isolated patches in protected draws, drainage heads, and swale bottoms. Silver sagebrush occurs in relatively mesic sites, and is generally found as stringers on the upper floodplain terraces of the larger creeks in the area, particularly the Dry Fork Marias River.

A notable area located in the northeastern portion of the Project Study Area is the Kevin Rim in Toole County, (48° 47' N, 112° 2' W). Kevin Rim is a prominent series of sandstone cliffs and outcrops that extend approximately 11 miles south-to-north beginning 5 miles northwest of the town of Kevin. Seventy-eight percent of land adjacent to Kevin Rim is comprised of grassland and grassland-sagebrush (*Artemisia cana*) rangelands, 20 percent is croplands, primarily non-irrigated wheat fields, and 2 percent is CRP lands (Zelenak 1996). Trees are rare in the Kevin Rim area and occur only as small stands of aspen (*Populus tremuloides*) and cottonwood (*Populus angustifolia*) in a few narrow, isolated draws (Dubois 1988). DeVelice (1991) has described the vegetation at the Kevin Rim in detail (1991).

Riparian communities within the Project Study Area are generally restricted to the Marias River, Teton River, coulee bottoms, and along the small, ephemeral tributaries of the Marias and Teton rivers that bisect the area. The character of these riparian zones is directly related to soil moisture as determined by drainage basin size and dimensions, the annual flooding regime, and the proximity to the head of the drainage. These drainages experience significant seasonal and annual hydrologic variability, resulting in relatively undeveloped floodplains in most of the Project Study Area. Riparian habitats are better developed and more complex along the Marias River and Teton River. The coulees and smaller streams are relatively xeric and do not support substantial riparian vegetation. Generally, riparian zones within the Project Study Area consist of herbaceous (*Carex* spp.) and willow (*Salix* spp.) communities in the wettest zones, which transition to western snowberry (*Symphorocarpos occidentalis*), Wood's rose (*Rosa woodsii*), and silver sagebrush-western wheatgrass communities on the upper floodplain terraces. The Marias River and Teton River support narrow, discontinuous patches of cottonwood forest interspersed by broader terraces supporting silver sagebrush-western wheatgrass. On shaded slopes of valleys and river terraces, aspen, willow (*Salix* spp.), cottonwood, and box-elder (*Acer negundo*) occur.

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The Marias and Teton rivers support the most significant forested riparian habitats in the Project Study Area. Riparian habitats along the Marias and Teton rivers include oxbow marshes and shrub-dominated terraces. The defining feature however, is the cottonwood gallery forest that lines the rivers. Despite the fact that these riparian cottonwood forests have been reduced and fragmented by conversion of the floodplain to irrigated agriculture and pasture (Jones 2003), they remain the only significant forested habitat within the Project Study Area. The width of the cottonwood gallery forest varies between 30 and 500 feet.

Mature cottonwood trees (>100 feet tall) dominate the Marias River and Teton River riparian communities. Mesic floodplains support a diverse understory that includes boxelder, peachleaf willow (*Salix amygdaloides*), yellow willow (*Salix lutea*), and chokecherry (*Prunus virginiana*). Xeric floodplain terraces support a less diverse shrub layer dominated by western snowberry and Wood's rose, or lack a shrub component altogether. The native grasses that once characterized these stands have been largely replaced by exotic species. Grazing has greatly altered the shrub composition in these communities (Jones 2003). River terraces that are no longer subjected to seasonal flooding often support a silver sagebrush-western wheatgrass community. Lack of flood disturbance has changed the ecological dynamics by suppressing cottonwood regeneration and facilitating the colonization of invasive species such as Russian olive (*Elaeagnus angustifolia*).

A list of native plant species that occur in the Project Study Area was compiled from MNHP and field investigations. This list is presented in **Table 4.5-3** and is not intended to be a comprehensive list, but is included to provide some insight into characteristic native plant communities that occur within the Project Study Area.

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TABLE 4.5-3
PLANT SPECIES IN PROJECT STUDY AREA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Common Name	Scientific name	Location
Short- and Mid-grass prairie		
Blue Grama	*Bouteloua gracilis*	Breaks above Marias and Teton Rivers
Thickspike Wheatgrass	*Elymus lanceolatus*	North of Cut Bank, some CRP
Needle-and-thread	*Hesperostipa comata*	Breaks above Marias and Teton Rivers, coulees
Northern Porcupine Grass	*Hesperostipa curtiseta*	Breaks above Marias and Teton Rivers
Green Needlegrass	*Nassella viridula*	Southern, below 230 kV Substation
Western Wheatgrass	*Pascopyrum smithii*	Breaks above Marias and Teton Rivers, coulees
Foxtail barley	*Hordeum jubatum*	Saline soil patches
Badlands		
Silver sagebrush	*Artemisia cana*	Kevin Rim, Dry Fork Marias River
Thickspike Wheatgrass	*Elymus lanceolatus*	North of Cut Bank
Creeping juniper	*Juniperus horizontalis*	Trunk Butte, Kevin Rim
Shrublands		
Silver sagebrush	*Artemisia cana*	Marias and Teton Rivers; Kevin Rim
Blue Grama	*Bouteloua gracilis*	Missouri Plateau breaks/Rim north of Great Falls; Marias and Teton Rivers
Needle-and-thread	*Hesperostipa comata*	Missouri Plateau breaks/Rim north of Great Falls; Marias and Teton Rivers
Western Wheatgrass	*Pascopyrum smithii*	Breaks above Marias and Teton Rivers, coulees
Silver Buffaloberry	*Sheperdia argentea*	Red River; coulees north of Cut Bank and central area

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Riparian		
Boxelder	*Acer negundo*	Kevin Rim; coulees
Silver Sagebrush	*Artemisia cana*	Marias, Teton, Dry Fork Marias Rivers
Sedge	*Carex spp.*	Marias and Teton Rivers, coulees
Spikerush	*Eleocharis spp.*	Teton River, coulees
Western Wheatgrass	*Pascopyrum smithii*	Marias and Teton Rivers, coulees
Plains Cottonwood	*Populus deltoides*	Marias and Teton Rivers
Narrowleaf Cottonwood	*Populus angustifolia*	Marias and Teton Rivers
Chokecherry	*Prunus virginiana*	Marias and Teton Rivers, coulees
Wild Currant	*Ribes spp.*	Marias and Teton Rivers, coulees
Wood's Rose	*Rosa woodsii*	Marias and Teton Rivers, coulees
Peachleaf Willow	*Salix amygdaloides*	Dry Fork Marias River, coulees
Willow	*Salix spp.*	Rivers, coulees
Silver Buffaloberry	*Sheperdia argentea*	coulees
Western Snowberry	*Symphoricarpos occidentalis*	Rivers, draws, coulees

Source: Cooper et al. 2001; MNHP 2004b, 2004c; Jones 2003; field investigations 2005

Invasive Species

An "invasive species" is defined as a species that is non-native to the ecosystem under consideration and whose introduction does or is likely to cause economic or environmental harm or harm to human health (USFR 1999). In Montana, a "noxious weed" is defined as any established or introduced exotic plant species, which may render the land unfit for agriculture, forestry, livestock, wildlife, or other beneficial, uses or that may harm native plant communities (MCA §7-22-2101 to 2153). Certain invasive species have a statewide designation as a noxious weed (MCA §7-22-2101 to 2153). Not all invasive plants are considered noxious weeds. The native plant communities within the Project Study Area are relatively fragmented and disturbed as described previously. Disturbances such as over-grazing and roads can increase opportunities for invasive nonnative plants to colonize. Patches of spotted knapweed (*Centaurea maculosa*) were found in the floodplain of the Marias River near Sullivan Bridge (Glacier County) and in the floodplain of the Teton River near Kerr Bridge (Teton County). Leafy spurge (*Euphorbia esula*) is also broadly distributed along the Marias River. Two additional noxious weeds, Canada thistle (*Cirsium arvense*) and field bindweed (*Convolvulus arvensis*) are located in the Project Study Area, but do not appear to pose a significant threat to native communities at this time. Canada thistle was found in the terraces above the Dry Fork Marias River. Several invasive species that are not currently designated as noxious weeds may pose a significant threat to native grassland communities. During field investigations, quackgrass (*Agropyron repens*), smooth brome (*Bromus inermus*), Japanese brome (*Bromus japonicus*), downy brome (*Bromus tectorum*), flixweed (*Descurainia sophia*), and foxtail barley (*Hordeum jubatum*) were identified in areas of natural vegetation. These species are fairly limited in patch size and distribution. In various coulees, quackgrass was found along the waterway, while smooth brome and Kentucky bluegrass (*Poa pratensis*) occur in the riparian zone and upland swales of the Teton River.

Baseline

The following discussion describes the vegetation distribution and potential occurrence for various plant species along each of the three alternative routes, as well as a direct comparison between the two northern border alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative). In accordance with *Circular MFSA-2* the following specific information will be addressed in the vegetation Baseline discussion:

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- Non-timbered grassland or rangeland [MFSA-2, 3.4.3.g],
- Forested lands [MFSA-2, 3.4.3.h], and
- Mature riparian forests [MFSA-2, 3.7.12.b.xxi].

The figures referenced in the Baseline section include the Land Use/Cover baseline overlays. This set is labeled **E-1a** through **E-14a** and contain the following data:

PLSS Grid;
U.S. Bureau of Reclamation Easements;
Montana FWP Easements;
USFWS Easements;
Conservation Reserve Program Easements;
National Trails;
Permitted Mines;
Populated Areas;
Developed Residential/Commercial/Industrial;
Cropland by Irrigation Class;
Non-Ag Grassland;
Non-Ag Forestlands (not designated as farm in CAMA);
Military Installations;
Open Water; and
Mature riparian forest

Preferred Alternative A

Preferred Alternative A would roughly parallel NorthWestern Energy's (NWE's) existing 115-kV transmission line from Cut Bank to the 230-kV Substation north of Great Falls (Baseline Base Topo Maps, **Figures E-1 to E-14**). The land along Preferred Alternative A is dominated by agriculture (90.1%) interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands. With the exception of grazing land near the Marias and Teton rivers, and coulees and drainages, this route is primarily composed of non-irrigated farmland and to a lesser extent irrigated farmland (**Table 4.5-4**).

TABLE 4.5-4
LINEAR MILES OF FARMLAND AND NON-FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover[1]	Preferred A	Alternative B	Alternative C	*Western Segment*	*Eastern Segment*
Sprinkler-Irrigated Farmland	16.28 (12.5%)	~~15.73 (12.6%)~~	~~12.63 (9.3%)~~	~~*0.00 (0.0%)*~~	~~*1.00 (5.4%)*~~
Other-Irrigated Farmland	0.91 (0.7%)	1.72 (1.4%)	4.16 (3%)	*0.00 (0.0%)*	*0.25 (1.4%)*
Non-Irrigated Farmland	99.86 (76.9%)	~~97.61 (78.4)~~	111.22 (81.5%)	~~*18.23 (98.5%)*~~	~~*15.08 (81.9%)*~~
Non-Farmland	12.84 (9.9%)	9.37 (7.6%)	8.48 (6.2%)	*0.27 (1.5%)*	*2.08 (11.3%)*
Total	129.89	124.43	136.49	*18.50*	*18.41*

[1]Source: Water permits submitted to the Montana DNRC and data from computer assisted mass appraisal (CAMA). CAMA is a computer-aided analysis of data describing property characteristics that is used in establishing property values for tax assessment.

GAP analysis data predict that non-timbered grassland or rangeland comprises approximately 36 percent of Preferred Alternative A, which, based on field investigations, is predominantly

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located near the Marias and Teton rivers, and along coulees and drainages. As observed during field investigations, forested lands along Preferred Alternative A occur predominantly as cottonwood gallery forest along the Marias and Teton Rivers and are predicted to comprise less than 1 percent of the total 1 mile buffer acreage along Preferred Alternative A (**Table 4.5-5**; "mixed broadleaf forest" and "broadleaf riparian" and **Table 4.5-6**).

TABLE 4.5-5
LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover Type[1]	Preferred Alternative A		Alternative B		Alternative C	
	Length (miles):	Percent:	Length (miles):	Percent:	Length (miles):	Percent:
Low/Moderate Cover Grasslands	42.24	32.5	40.32	32.4	39.68	29.1
Agricultural Lands – Irrigated[2]	39.37	30.3	38.21	30.7	40.17	29.4
Agricultural Lands – Dry[2]	33.67	25.9	35.71	28.7	40.47	29.7
Altered Herbaceous	5.17	4.0	2.45	2	6.54	4.8
Moderate/High Cover Grasslands	1.74	1.3	1.03	0.8	1.74	1.3
Very Low Cover Grasslands	2.58	2.0	2.55	2	2.43	1.8
Rock	0.61	0.5	0.9	0.7	0.9	0.7
Graminoid and Forb Riparian	1.30	1.0	1.28	1	1.32	1
Ponderosa Pine[3]	.95	0.7	.59	0.5	1	0.7
Shrub Riparian	0.31	0.2	.11	0.1	0.22	0.2
Rocky Mountain Juniper	0.0	0.0	0.2	0.2	0	0.0
Mixed Mesic Shrubs	0.44	0.3	0.29	0.2	0.75	0.6
Mixed Barren Sites	0.44	0.3	0.21	0.2	0.06	0.0
Mixed Xeric Forest	0.17	0.1	0.17	0.1	0.17	0.1
Mixed Broadleaf Forest	0.0	0.0	0.04	0.0	0.26	0.2
Conifer Riparian[3]	0.82	.06	0.38	0.3	0.47	0.3
Salt-Desert Shrub/Dry Salt Flat	0.07	0.1	0.0	0.0	0.17	0.1
Water	0.0	0.0	0.0	0.0	0.04	0.0
Broadleaf Riparian	0.01	0.0	0.0	0.0	0.1	0.1

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

Table 4.5-5a shows a direct comparison between the 18.5 mile Western Alternative Segment and the 18.41 mile Eastern Alternative Segment (northern most segment of the Preferred Alternative A). The Western Alternative Segment has comparatively more grasslands, than the Eastern Alternative Segment.

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TABLE 4.5-5a
LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG THE WESTERN AND EASTERN ALTERNATIVE SEGMENTS
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover Type[1]	Eastern Alternative		Western Alternative	
	Length (miles):	Percent:	Length (miles):	Percent:
Low/Moderate Cover Grasslands	8.56	46.5	10.52	56.9
Agricultural Lands – Dry[2]	5.25	28.5	3.47	18.8
Agricultural Lands - Irrigated[2]	3.21	17.4	1.79	9.7
Altered Herbaceous	--	--	0.48	2.6
Very Low Cover Grasslands	0.22	1.2	0.45	2.4
Moderate/High Cover Grasslands	0.42	2.3	1.18	6.4
Graminoid and Forb Riparian	0.53	2.9	0.15	0.8
Ponderosa Pine[3]	--	--	--	--
Conifer Riparian[3]	--	--	--	--
Rock	--	--	0.28	1.5
Mixed Barren Sites	0.14	0.8	--	--
Mixed Mesic Shrubs	--	--	0.18	0.9
Shrub Riparian	0.07	0.4	--	--
Mixed Xeric Forest	--	--	--	--
Salt-Desert Shrub/Dry Salt Flat	--	--	--	--
Broadleaf Riparian	--	--	--	--

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

Table 4.5-6 illustrates the acres of mature riparian forest within the 1-mile impact zone along each of the three alternatives. This information was collected through a combination of field surveys performed in July and August 2005 and August 2006, as well as through the examination of aerial photographs taken in October 2005. Both the GAP data and the field- and aerial photo-collected data indicate less than 1 percent of Preferred Alternative A consists of mature riparian forest. In addition, for comparison purposes, neither the Western Alternative Segment nor the Eastern Alternative Segment shows any mature riparian forest within the 1-mile impact zone.

TABLE 4.5-6
ACRES OF MATURE RIPARIAN FOREST WITHN THE 1-MILE IMPACT ZONE FOR EACH ALTERNATIVE
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Preferred Alternative A		Alternative B		Alternative C	
Acres	Percent of Total Impact Zone	Acres	Percent of Total Impact Zone	Acres	Percent of Total Impact Zone
76.60	0.05	47.25	0.03	164.16	0.09

Preferred Alternative A crosses the Red River, Fitzpatrick Coulee, and Old Maids Coulee north of Cut Bank. These drainages are relatively small and narrow and support only a narrow riparian community where water is present year-round. The majority of the land crossed north

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Deleted: TABLE 4.5-5¶ LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE¶ MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT ... [5]
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of Cut Bank is cultivated farmland. Rangeland dominated by wheatgrass occurs near the southern edge of the town of Cut Bank. After the route would tie in to the new Marias Substation south of Cut Bank it would extend southeastward toward the Marias River. **Table 4.5-7** lists at which river mile(s) Preferred Alternative A crosses a particular water body.

TABLE 4.5-7
DRAINAGES AND WATER BODIES CROSSED NORTH TO SOUTH BY PREFFERED ALTERNATIVE A
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Water body	River Miles[1]
Red River	8.00 miles
Fitzpatrick Coulee	8.97 miles
Old Maids Coulee	4.95, 5.06 and 10.09 miles
Marias River	171.23 miles
Bullhead Creek	9.94 miles
Winginaw Coulee	0.22 miles
Ringwald Coulee	0.37 miles
Schultz Creek	21.87 miles
Dry Fork Marias River	27.59 miles
Spring Creek	4.55 miles
Pondera Coulee	95.85 miles
Railroad Coulee	3.75 miles
South Pondera Coulee	16.86, 17.15 and 17.30 miles
Brady Coulee	3.83 miles
Rocky Coulee	16.15 miles
Teton River	96.04 miles
Hunt Coulee	2.17 miles
Kinley Coulee	6.34 miles
Unnamed Stream	1.36 miles
Timber Coulee	16.58 miles
Unnamed Stream	3.11 miles
Huntley Coulee	25.21 miles

[1] Source: Montana Fish, Wildlife, and Parks. River miles listed are the point locations at which the alternative would cross the particular water body. River miles are published as an aid to people using the river for commerce, recreation and emergency services. As one travels upstream, the numbers increase until the last listed mile of the navigation map. If multiple river miles are listed then the route crosses that particular water body multiple times.

Preferred Alternative A would cross the Marias River just east of the existing NWE 115-kV transmission line. The Marias River at this crossing location is broad with a narrow band (approximately 20 feet wide) of herbaceous/shrub riparian vegetation. Mature riparian forest with stands of cottonwood occurs within the 1-mile impact zone on both the west and east sides of the actual crossing. These stands are greater than 300 feet long and 30 feet wide with an average canopy height of 50 feet or more and average density of mature trees greater than 20 stems per acre [MFSA-2 3.7.12.b.xxi].

South of the Marias River, Preferred Alternative A crosses the western edge of the area known as Willow Rounds. The dominant grass community here is grama-needlegrass. South of Willow Rounds, the route traverses farmland and then crosses Bullhead Creek east of Bullhead Lake. At this crossing, the drainage is narrow (less than 20 feet) supporting primarily herbaceous (*Carex* spp. and *Juncus* spp.) and some shrub riparian vegetation. After crossing Winginaw Coulee, Preferred Alternative A follows the south side of Bullhead Creek heading east-southeast and along the north side of Trunk Butte.
Winginaw Coulee was dry at the time of the field survey (July 2005) and supported no riparian vegetation.

Deleted: Preferred Alternative A crosses Pearsons Coulee, Red River, and Old Maids Coulee north of Cut Bank. All of these drainages are relatively small and narrow and support a narrow riparian community where water is present year-round. With the exception of some prairie pothole wetlands, the majority of the land crossed north of Cut Bank is farmland. Rangeland dominated by wheatgrass occurs near the southern edge of the town of Cut Bank where the route would traverse to tie in to Glacier Electric Co-op's Cut Bank Substation. After the route would tie in to the Cut Bank Substation it would extend southeastward toward the Marias River. **Table 4.5-7** lists at which river mile(s) Preferred Alternative A crosses a particular water body.¶
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Midway along Trunk Butte, Preferred Alternative A heads due south toward Belgian Hill crossing cultivated farmland. Preferred Alternative A crosses the Dry Fork Marias River northwest of the town of Conrad. The Dry Fork crossing is relatively narrow (approximately 20 feet) supporting primarily herbaceous and shrub riparian vegetation. South of the Dry Fork Marias River, the route crosses McLean State Game Preserve. The dominant vegetation community within the McLean State Game Preserve is wheatgrass and alfalfa; however, a portion of the Preserve is cultivated for wheat. South of the Game Preserve, the route would extend south and then southeastward traversing farmland west of Conrad.

South of Conrad, Preferred Alternative A would cross Pondera Coulee, the Burlington Northern Santa Fe Railroad, and then Interstate Highway15. East of Interstate 15, the route traverses cultivated farmland until just above the Teton River.

Preferred Alternative A would span the Teton River approximately 1/4 mile east of 17th lane, on State of Montana land. The area where the line would span the river is a quarter-mile wide gap in the riparian cottonwood forest.

After spanning the Teton River, Preferred Alternative A would traverse across approximately 1 mile of rangeland dominated by a grama-needlegrass community and then cross Hunt Coulee. Hunt Coulee is a steep yet narrow drainage the sides of which are dominated by western snowberry, Wood's rose, and silver sagebrush-western wheatgrass communities. Southeast of Hunt Coulee, Preferred Alternative A would traverse farmland and the following coulees (from north to south): Kinley, Unnamed, Timber, Unnamed (2), and Huntley. All of the aforementioned coulees are relatively narrow (less than 20 feet) and support little to no riparian vegetation.

Preferred Alternative A would traverse the area approximately 1 mile east of the eastern boundary of the USFWS Benton Lake National Wildlife Refuge. The vegetation within the eastern boundary of the Refuge consists of needlegrass and wheatgrass; however, outside the Refuge boundary, where the route would extend is dry cropland. At this point the route extends due south crossing through a low point in the bluffs above Black Horse Lake Flat. This area is dominated by dry cropland interspersed with some pasture. From here the route would cross Highway 87 and then jog southwest to pass a butte and the Great Falls Shooting Complex on the west side. After passing the Shooting Complex, Preferred Alternative A would extend southward crossing dry cropland, then due east for 1 mile to realign with NWE's 230-kV Substation and then straight south into the Substation north of Great Falls.

Alternative B

As previously described, Alternative B would follow a similar path as Preferred Alternative A. The land along Alternative B is dominated by agriculture (92.4%) interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands. With the exception of grazing lands, coulees, drainages, and the Marias and Teton River crossings, this route is primarily composed of non-irrigated farmland and irrigated farmland (**Table 4.5-4**).

GAP analysis data predicts that non-timbered grassland or rangeland comprises approximately 35 percent of Alternative B, which based on field investigations, is predominantly located near the Marias and Teton rivers. As observed during field investigations, forested lands along Alternative B occur predominantly as cottonwood gallery forest along the Marias and Teton rivers and are predicted to comprise less than 1 percent Alternative B (**Tables 4.5-5** and **4.5-6**). Alternative B crosses Pearsons Coulee, the Red River, and Old Maids Coulee north of Cut Bank. All of these drainages are relatively small and narrow and support a narrow riparian community where water is present year-round. Table **4.5-8** lists all water crossings along

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Preferred Alternative A would cross the Marias River east of the existing NWE 115-kV transmission line. The Marias River at this crossing location is broad with a narrow to wide band (approximately 20 feet to up to 50 feet wide) of herbaceous/shrub riparian vegetation. Mature riparian forest with stands of cottonwood occurs within the 1-mile impact zone on both the west and east sides of the crossing. These stands are greater than 300 feet long and 30 feet wide with an average canopy height of 50 feet or more and average density of mature trees greater than 20 stems per acre [MFSA-2 3.7.12.b.xxi]. Cottonwood trees and willows grow along Two Medicine River, but do not extend as far east as GAP data predicts. ¶
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South of the Marias River, Preferred Alternative A crosses the western edge of the area known as Willow Rounds. The dominant grass community here is grama-needlegrass. South of Willow Rounds, the route traverses farmland and then crosses Bullhead Creek east of Bullhead Lake. At this crossing, the drainage is narrow (less than 20 feet) supporting primarily herbaceous (*Carex* spp. and *Juncus* spp.) and some shrub riparian vegetation. The route would traverse farmland in between the next two coulees to the south, Winginaw Coulee and then Ringwald Coulee. Both of these drainages were dry at the time of the field survey (July 2005) and supported no riparian vegetation. ¶
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Preferred Alternative A crosses the Dry Fork Marias River northwest of the town of Conrad. The Dry Fork crossing is relatively narrow (approximately 20 feet) supporting primarily herbaceous and shrub riparian vegetation. South of the Dry Fork Marias River, the route crosses McLean State Game Preserve. The dominant vegetation community within the McLean State Game Preserve is wheatgrass and alfalfa; however, a portion of the Preserve is cultivated for wheat. South of the Game Preserve, the route would extend south and then southeastward traversing farmland west of Conrad.¶
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South of Conrad, Preferred Alternative A would cross Pondera Coulee. One-quarter mile nortl ... [7]

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Alternative B. With the exception of some prairie pothole wetlands, the majority of the land crossed north of Cut Bank is farmland. Near the southern edge of the town of Cut Bank where the route would traverse to tie in to Glacier Electric's Cut Bank Substation, rangeland dominated by wheatgrass occurs. After tying in to the Cut Bank Substation the route would extend southeastward toward the Marias River.

TABLE 4.5-8
DRAINAGES AND WATER BODIES CROSSED NORTH TO SOUTH BY ALTERNATIVE B
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Water body	River miles[1]
Pearsons Coulee	2.94 miles
Red River	12.58 miles
PEMA/PEMC Wetlands	.05 miles
PEMC Wetlands	.06 miles
Old Maids Coulee	10.38 miles, 10.21 miles, and 10.04 miles
Marias River	171.08 miles
Bullhead Creek	10.07 miles
Winginaw Coulee	1.17 miles
Barber Coulee	1.06 and 1.48 miles
Dry Fork Marias River	30.22 miles
Spring Creek	2.96 miles
Pondera Coulee	93.62 miles
Railroad Coulee	1.39 miles
South Pondera Coulee	16.06 miles
Brady Coulee	3.76 miles
Rocky Coulee	15.84 miles
Teton River	94.11 miles
Hunt Coulee	1.18 miles
Kinley Coulee	5.21 miles
Unnamed	0.55 miles
Timber Coulee	8.92 miles
Rye Coulee	6.79 miles
Sheep Coulee	13.14 miles
Huntley Coulee	25.26 miles
PEMAd Wetlands off Black Horse Lake	.02 miles

[1] Source: Montana Fish, Wildlife, and Parks. River miles listed are the point locations at which the alternative would cross the particular water body. River miles are published as an aid to people using the river for commerce, recreation and emergency services. As one travels upstream, the numbers increase until the last listed mile of the navigation map. If multiple river miles are listed then the route crosses that particular water body multiple times.

Alternative B crosses the Marias River south of Glacier Electric's Cut Bank Substation. At this crossing location, the river is relatively broad with a narrow band (approximately 20 feet wide) of herbaceous/shrub riparian vegetation. Mature riparian forest with stands of cottonwood greater than 300 feet long and 30 feet wide with an average canopy height of 50 feet or more and average density of mature trees greater than 20 stems per acre does exist within the one-mile impact zone to the west and east of the actual crossing [MFSA-2 3.7.12.b.xxi].

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South of the Marias River, Alternative B would follow a similar route as Preferred Alternative A. Southwest of Conrad, Alternative B would cross Pondera Coulee. This drainage is relatively narrow (approximately 20 feet) and supports primarily herbaceous and shrub riparian vegetation. After crossing Pondera Coulee, Alternative B would cross I-15 south of Conrad and then South Pondera Coulee, Brady Coulee, and Rocky Coulee. All three coulees support little to no riparian vegetation. Alternative B would then traverse cropland until crossing the Teton River approximately 1 mile west of Kerr Bridge (20th Lane). The route would span the Teton River approximately 100 yards east of a mature riparian cottonwood forest. The floodplain on either side of the Teton River at this crossing contains pockets of smooth brome and some knapweed.

After spanning the Teton River, Alternative B would traverse across approximately 1 mile of rangeland dominated by a grama-needlegrass community and then cross Hunt Coulee. Hunt Coulee is a steep yet narrow drainage, the sides of which are dominated by western snowberry, Wood's rose, and silver sagebrush-western wheatgrass communities. Southeast of Hunt Coulee, Alternative B would traverse farmland and the following coulees (from north to south): Kinley, Unnamed, Timber, Rye, and Sheep. All of the aforementioned coulees are relatively narrow (less than 20 feet) and support little to no riparian vegetation. After crossing Sheep Coulee, Alternative B would continue extending southeast across farmland.

Alternative B would traverse the area approximately 1 mile east of the eastern boundary of the USFWS Benton Lake National Wildlife Refuge. The vegetation within the eastern boundary of the Refuge consists of needlegrass and wheatgrass; however, outside the Refuge boundary, where the route would extend is dry cropland. At this point the route extends due south crossing through a low point in the bluffs above Black Horse Lake Flat. This area is dominated by dry cropland interspersed with some pasture. From here the route would extend southward crossing dry cropland until it ties in with NWE's 230-kV Substation.

Alternative C

Alternative C is dominated by agriculture (94%) interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands. With the exception of grazing land near Willow Rounds, coulees, drainages, and the Marias River and Teton River crossings, this route is primarily composed of non-irrigated farmland and irrigated farmland (**Table 4.5-4**).

GAP analysis data predicts that non-timbered grassland or rangeland comprises approximately 32 percent of Alternative C, which based on field investigations, is predominantly located near the Marias and Teton rivers, and along coulees and drainages. As observed during field investigations, forested lands along Alternative C occur predominantly as cottonwood gallery forest along the Marias and Teton rivers and are predicted to comprise less than 1 percent of Alternative C (**Table 4.5-5 and 4.5-6**).

Alternative C crosses Pearsons Coulee, Red River, Fitzpatrick Coulee, and Old Maids Coulee north of Cut Bank. All of these drainages are relatively small and narrow and do not support a riparian community. The route also skirts past a small area of Hay Lake. With the exception of some prairie pothole wetlands, the majority of the land crossed north of Cut Bank is farmland. Near the southern edge of the town of Cut Bank where the route would traverse to tie into Glacier Electric's Cut Bank Substation rangeland dominated by wheatgrass occurs. South of Cut Bank, Alternative C traverses southeast toward the Marias River. **Table 4.5-9** lists all water crossings along Alternative C.

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TABLE 4.5-9 DRAINAGES AND WATER BODIES CROSSED NORTH TO SOUTH BY ALTERNATIVE C MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Water body	**River Miles[1]**
Pearsons Coulee	0.78 miles
Red River	9.60 miles
Fitzpatrick Coulee	2.45 miles
Hay Lake	.07 miles of route edges
Old Maids Coulee	16.52, 10.38, 10.21, and 10.04 miles
Marias River	169.47 miles
Bullhead Creek	3.40 miles
Schultz Creek	17.72 miles
Dry Fork Marias River	17.95 miles
Pondera Coulee	86.04 miles
School Section Coulee	1.32 miles
Oliver Coulee	1.10 miles
South Pondera Coulee	10.43 miles
Rocky Coulee	12.36 miles
Flat Coulee	6.19 miles
Unnamed	9.74 miles
Teton River	62.04 miles
Wolf Coulee	1.40 miles
Alkali Coulee	7.33 miles
Huntley Coulee	23.01 miles
PEMAd Wetlands off of Black Horse Lake	0.02 miles

[1] Source: Montana Fish, Wildlife, and Parks. River miles listed are the point locations at which the alternative would cross the particular water body. River miles are published as an aid to people using the river for commerce, recreation and emergency services. As one travels upstream, the numbers increase until the last listed mile of the navigation map. If multiple river miles are listed then the route crosses that particular water body multiple times.

Alternative C would cross the Marias River just east of the Glacier/Toole County line in Toole County where the river makes a bend to the south. The alternative would cross over mechanically irrigated cropland (alfalfa) and a relatively broad band (approximately 30 feet) of riparian herbaceous/shrub vegetation. South of the Marias River, Alternative C would cross Willow Rounds and Abbott Coulee. A grama-needlegrass community type dominates Willow Rounds in this area. The Willow Rounds area is higher in elevation, and more rugged (slopes > 30%) than the crossing location of Alternatives A and B.

South of Willow Rounds, Alternative C would traverse farmland then cross Bullhead Creek. The Bullhead Creek crossing is narrow (less than 20 feet) supporting primarily herbaceous and some shrub riparian vegetation. Southeast of Bullhead Creek, Alternative C would cross the eastern tip of Trunk Butte. The sides of Trunk Butte at this point have exposed shale outcroppings dominated by creeping juniper (*Juniperus horizontalis*) and sage. The route would then cross Schultz Creek, which is a relatively narrow drainage with fairly steep slopes on either side dominated by a grama-needlegrass community. The coulee itself has a very narrow (less than 20 feet) band of herbaceous/shrub riparian vegetation.

After crossing Schultz Creek, Alternative C would traverse farmland and then cross over I-15 northeast of Conrad. East of I-15, Alternative C continues southeastward, crossing Old North Trail and then the Dry Fork Marias River. The riverbed at this crossing is relatively narrow (approximately 10 feet), but the floodplain extends approximately one-quarter mile on either side and is dominated by wheatgrass and smooth brome. The riparian vegetation consists of sedge and willow species adjacent to the riverbank. South of Dry Fork, Alternative C would traverse farmland and then cross Pondera Coulee. This crossing is relatively narrow (approximately 20

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feet or less) and supports little to no riparian vegetation with cropland on either side. From there the route crosses School Section Coulee and Oliver Coulee and on to South Pondera Coulee.

After crossing South Pondera Coulee, which contains little to no riparian vegetation, Alternative C extends southeastward crossing Rocky Coulee. The route then heads due east crossing Flat Coulee, and an "unnamed" coulee both of which contain little to no riparian vegetation. Just west of Dent Bridge Rd. Alternative C would make a right angle to the south traversing cropland and then crossing the Teton River just east of Woods Crossing. The drainage at this crossing is relatively wide (approximately 1 mile) and is flanked by shallow to steep slopes on the north and south, which are dominated by a grama-needlegrass community. The floodplain is broadest on the north side of the crossing and contains mechanically irrigated cropland interspersed with mature riparian forest. Downy brome was observed in the vicinity of the Teton River crossing of Alternative 3. The route would then traverse Antelope Flat southward and pass along the eastern boundary of the USFWS Benton Lake National Wildlife Refuge. The vegetation communities traversed are nearly identical to those traversed by Preferred Alternative A and Alternative B before tying in to NWE's 230-kV Substation.

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Western/Eastern Alternative Segment Comparison

The Western Alternative Segment does not cross any water bodies along its 18.5 mile length. The Eastern Alternative Segment crosses the Red River and Fitzpatrick Coulee along its 18.41 mile length.

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Environmental Consequences

The following discussion fulfills the baseline impact assessment requirements as outlined in *Circular MFSA-2*. The potential adverse impacts include injury or mortality of vegetation, fugitive dust generation, exposure to contaminants, spread of invasive vegetation, and fire (**Table 4.5-10**). Where possible these impacts would be reduced or avoided through the implementation of mitigation and/or avoidance measures (see **Table 5-2**).

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TABLE 4.5-10
SUMMARY OF POTENTIAL PROJECT IMPACTS TO VEGETATION DUE TRANSMISSION LINE CONSTRUCTION, OPERATION, AND MAINTENANCE

Impact Type	Associated Activity or Feature	Potential Impact	Duration
Direct injury or mortality of vegetation	Access road and transmission corridor construction; construction equipment travel.	Destruction and injury of vegetation, habitat reduction or degradation.	Long-term within construction footprints for transmission line structures and access roads; short-term in areas adjacent to the construction area.
Fugitive dust generation	Access road and transmission route construction; construction equipment.	Damage to plant cuticle, which increases water loss; decreased carbon dioxide uptake, decreased photosynthesis.	Short-term and localized.
Exposure to contaminants	Accidental spill of pesticides, fuel, or materials.	Exposure may affect plant survival, reproduction, or growth.	Short-term and localized to spill area.
Invasive vegetation/ Noxious weeds	Access road and transmission route construction	Establishment of invasive vegetation/noxious weeds, decrease in native vegetation.	Long-term both on and off site.
Fire	Access to surrounding areas along facility access roads and transmission routes.	Loss of native vegetation; introduction and establishment of invasive vegetation.	Long-term

Source: Adapted from USDI 2004a

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Land use, cover type, and vegetation data indicate very minor differences among the alternatives. All three alternatives traverse a similar rural landscape and there are no substantive differences among the amount of farmland, native grassland, and forestland on the three alternatives. Consequently, differences in impacts to vegetation among the three alternatives are minimal.

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Preferred Alternative A

Preferred Alternative A would cross approximately 12.84 miles of non-farmland, which is about 10 percent of the entire route. The route was delineated in such a way as to avoid all known occurrences of sensitive plant species and potential habitat of sensitive plant species. Of the 12.84 miles of natural vegetation along the route (non-farmland) approximately 59 percent is very low to high cover grasslands and 0.05 percent is riparian forest (**Table 4.5-6**). Potential impacts to grasslands and riparian vegetation from construction, operation, and maintenance of the proposed transmission line will be mitigated or avoided using the measures summarized in **Table 5-2**. No pristine forests, grasslands, or plant species of concern occur along Preferred Alternative A and therefore none would be impacted by the proposed Alternative. Short-term impacts associated with this route would include temporary disturbances to the existing natural vegetative communities described above, most notably the grasslands above the Marias River and Teton River where grama-needlegrass communities exist. Because disturbed areas are generally more susceptible to colonization of invasive nonnative species, following construction, disturbed ground would be reseeded with native vegetation to reduce the potential for colonization and spread by invasive nonnative species. Furthermore, all efforts will be made to completely span all areas where riparian vegetation exists including, but not limited to, all wetlands, coulees, Marias River, and Teton River. No transmission line structures would be placed in riparian vegetation and all equipment would avoid wooded areas including mature riparian cottonwood forests.

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Alternative B

Alternative B would cross approximately 9.37 miles of non-farmland, which is 6 percent of the entire route. Of the 9.37 miles of natural vegetation (non-farmland) approximately 35.45 percent is very low to high cover grasslands and less than 1 percent is riparian forest (**Table 4.5-6**). Potential impacts to grasslands and riparian vegetation due to construction, operation, and maintenance of the proposed transmission line would be mitigated using the measures summarized in **Table 5-2**. As no pristine forests or grasslands occur along Alternative B none would be impacted by the proposed Project. Short-term impacts of this route would include temporary disturbances to the existing natural vegetative communities described above, most notably the grasslands above the Marias River and Teton River where grama-needlegrass communities exist. Because disturbed areas are generally more susceptible to colonization of invasive nonnative species, following construction, the disturbed area would be reseeded with native vegetation to reduce the potential for colonization and spread by invasive nonnative species. Furthermore, all efforts will be made to completely span all areas where riparian vegetation exists including, but not limited to, all wetlands, coulees, Marias River, and Teton River. No transmission line structures would be placed in riparian vegetation and all equipment would avoid wooded areas including mature riparian cottonwood forests.

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Alternative C

Alternative C would cross approximately 8.5 miles of non-farmland, which is 6.2 percent of the entire route. The route was delineated in such a way as to avoid all known occurrences of sensitive plant species and potential habitat of sensitive plant species. Of the 8.5 miles of

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natural vegetation along the route (non-farmland) 32 percent is very low to high cover grasslands and less than 1 percent is riparian forest (**Table 4.5-6**). The grasslands, mesic shrubs, and riparian vegetation that may potentially be impacted by construction, operation, and maintenance of the proposed transmission line would be mitigated or avoided using the measures summarized in **Table 5-2**. As no pristine forests, grasslands, or plant species of concern occur along Alternative C none would be impacted by the proposed Project. Short-term impacts of this route would include temporary disturbances to the existing natural vegetative communities described above, most notably the grasslands above the Marias River and Teton River where grama-needlegrass communities exist. Because disturbed areas are generally more susceptible to colonization of invasive nonnative species, following construction, the disturbed area would be reseeded with native vegetation to reduce the potential for colonization and spread by invasive nonnative species. Furthermore, all efforts would be made to completely span all areas where riparian vegetation exists including, but not limited to, all wetlands, coulees, Marias River, and Teton River. All efforts would be made to avoid constructing poles in riparian vegetation and all equipment would avoid wooded areas including mature riparian cottonwood forests.

4.5.2 Wetlands

This section addresses the current state of wetlands in the Project Study Area. Resources addressed in this section include wetlands and related features. Wetland information was acquired from various sources including the Montana Natural Heritage Program (MNHP), the Montana Natural Resources Information System (MNRIS), The National Wetlands Inventory (NWI), and the Federal Emergency Management Agency (FEMA). NWI and FEMA data coverage for the Project Study Area is incomplete. No wetland delineation has occurred in the Project Study Area. USGS 7.5" topographic maps were also used to help identify water features. Data from existing FEMA and NWI sources were digitized or imported into existing base maps created for the proposed Project. NWI data are not available for the section of the Project Study Area from approximately the town of Brady south to just north of Benton Lake National Wildlife Refuge (NWR). Other sources of data include existing documentation of regional features from public agencies, literature review, and color aerial photographs of the routes taken in October 2005. Field investigations were conducted in July and August 2005 to ground-truth mapped wetlands and identify previously unmapped wetlands.

Overview

As discussed in *Section 4.5.1*, the Project Study Area is located within the Northwestern Glaciated Plains ecoregion of the Great Plains physiographic province (Omernik 1987). Within this ecoregion is a rather high concentration of semi-permanent and seasonal wetlands referred to as prairie potholes. Most notably, north of Cut Bank, is the level IV ecoregion known as the Milk River Pothole Upland. Glaciated prairie pothole wetlands are wetlands formed primarily by continental (or in some cases mountain) glacier activity during the Pleistocene Epoch. Most are small pothole wetlands in a matrix of grassland (or agricultural fields). Important cover types include marsh, mud flats, wet meadow, and open water. Hydrologic regimes vary, from permanent, semi-permanent, or seasonal, to temporary (MPIF 2000).

The following discussion describes the distribution and potential occurrence for various wetlands within the Project Study Area. In accordance with *Circular MFSA-2* the Overview section will discuss State/Federal Waterfowl Production Areas (WPAs) [Circular MFSA-2, 3.4.1.b]. Water bodies 20 acres or larger in size are discussed later in this section under the Baseline discussion; and are also discussed in Section 4.4.3. Figures referenced in the

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Overview section include the 1:100,000 scale Hydrology Overview overlays (**Figures D-3-North and D-3-South**), which contain the following data:

Study Area Boundary
PLSS Grid
Potable surface water
303(d) streams
Class I/II Fisheries;
Surface water greater than 20 acres
Municipal watersheds

The second set of overlays referenced in the Overview section is the 1:100,000 scale Wildlife overlays (**Figures D-5-North and D-5-South**), which contain the following data:

Study Area Boundary
PLSS Grid
Field Surveyed Leks
Class I/II Fishery Streams
Sage Grouse Habitat
Elk Winter Range
Mule Deer Winter Range
Waterfowl Production Areas
Fishing Access Sites
Prime Waterfowl Habitat

The Project Study Area is within the Benton Lake Wetland Management District (WMD). Within this WMD are five Waterfowl Production Areas (WPAs) (**Table 4.5-11; Figures D-5-North** and **D-5-South**). WPA's preserve wetlands and grasslands critical to waterfowl and other wildlife. These public lands, managed by the U.S. Fish and Wildlife Service (USFWS), were included in the National Wildlife Refuge System (NWRS) in 1966 through the National Wildlife Refuge Administration Act. Congress amended the Duck Stamp Act (passed in 1934) in 1958 to authorize acquisition of wetlands as WPAs. This helped the USFWS acquire wetlands and therefore prevent them from being drained for irrigation purposes and other types of development (NWRS 2005).

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TABLE 4.5-11
WATERFOWL PRODUCTION AREAS WITHIN THE PROJECT STUDY AREA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Name	Size (acres)	County	Description[1]
Brumwell	267	Teton	Located along I-15; railroad on eastern boundary; disturbed area; rarely holds water; when wet it is productive for ducks, other waterfowl.
Hartelius	306	Cascade	Rarely holds water; mostly all seeded with legume mix
Brown	306	Toole	Small wetland that rarely holds water; when it is wet productive for waterfowl; surrounded by many prairie potholes; seeded with legume mix.
Cemetery	96	Toole	Not a very productive WPA; poor quality wildlife habitat; surrounded by native grassland.
Peterson	93	Glacier	Marsh almost always holds water, productive for ducks and other waterfowl.

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[1] Sources: Phone interview with Bob Johnson, Refuge Supervisor, USFWS Benton Lake NWR; field investigations 2005.

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Wetlands are intrinsically important because they can provide essential wildlife habitat, and perform hydrologic (e.g., flood attenuation, surface water, ground water recharge) and water quality (sediment retention, pollution control) functions. The NWI identifies 15 wetland types within the Project Study Area. All types are Palustrine or Riverine. The Palustrine system includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses, or lichens. Wetlands lacking such vegetation are also included in this type if they exhibit all of the following characteristics:

Are less than 8 hectares (20 acres)
Do not have an active wave-formed or bedrock shoreline feature
Have at low water a depth less than 2 meters (6.6 feet) in the deepest part of the basin
Have salinity due to ocean-derived salts of less than 0.5 parts per thousand

All water bodies visible on the aerial photography that are less than 20 acres in size are considered to be in the Palustrine System unless depth information is available, or unless an active wave-formed or bedrock shoreline feature is visible (NWI 2004). The Riverine system includes all wetlands and deepwater habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. The Lacustrine System includes both natural lakes and lacustrine impoundments. Lacustrine wetlands are assigned to limnetic or littoral subsystems.
NWI Wetland Classes identified in the Project Study Area include:

Lacustrine, Littoral, Unconsolidated Shore, Temporarily Flooded, Partly Drained (L2USAd)
Lacustrine, Littoral, Aquatic Bed, Semipermanently Flooded (L2ABF)
Palustrine, Aquatic Bed, Semipermanently Flooded, Diked/Impounded (PABFh)
Palustrine, Emergent, Temporarily flooded (PEMA)
Palustrine, Emergent, Temporarily flooded, Diked/Impounded (PEMAh)
Palustrine, Emergent, Saturated (PEMB)
Palustrine, Emergent, Seasonally Flooded (PEMC)
Palustrine, Emergent, Seasonally Flooded, Diked/Impounded (PEMCh)
Palustrine, Aquatic Bed, Semipermanently Flooded (PABF)
Palustrine, Emergent, Temporarily flooded, Partially Drained/Ditched (PEMAd)
Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Excavated (PUBFx)
Palustrine, Unconsolidated Shore, Temporarily Flooded (PUSA)
Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH)
Riverine, Upper Perennial, Unconsolidated Shore, Seasonally Flooded (R3USC)
Palustrine, Aquatic Bed, Semipermanently Flooded, Excavated (PABFx)
Palustrine, Unconsolidated Shore, Temporarily Flooded (PUSA)
Palustrine, Unconsolidated Shore, Temporarily Flooded, Diked/Impounded (PUSAh)
Palustrine, Scrub-Shrub, Temporarily Flooded (PSSA)

Wetlands within the Project Study Area appear to be most commonly associated with palustrine areas along creeks, often in drainages known as "coulees". Coulees are a regional feature associated with enclosed bottomlands, and are typified by flat-bottomed valleys enclosed by somewhat steep hillsides. In these drainages, there is a relative abundance of trees and understory shrubs such as boxelder (*Acer negundo*), silver sagebrush, chokecherry, Wood's rose, willow, silver buffaloberry, and western snowberry. Wetland areas within coulees are generally narrow and associated with incised stream channels. Vegetation types in these "coulee wetlands" include marshes and wet meadows.

Prairie potholes are often less than 1 acre in size and are characterized by ephemeral or seasonal inundation. Many are landlocked, while others have a drainage outlet to streams or

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other potholes. Most have standing water for much of the growing season in years of normal or above normal precipitation. However, most are neither inundated nor have saturated soils during most of the growing season in years of below normal precipitation. During dry years, potholes often become incorporated into farming plans, and are either planted to row crops (e.g. wheat) or are mowed as part of a haying operation. When this occurs, wetland indicators of one or more parameters may be lacking. For example, tillage would eliminate any on-site hydrologic indicator, and would make detection of soil and vegetation indicators much more difficult (USGS 2005). The U.S. Army Corps of Engineers (ACOE) identifies prairie potholes as potential "problem areas" for identification. There are certain wetland types and/or conditions that may make application of indicators of one or more parameters difficult, at least at certain times of the year. These are not considered to be atypical situations; instead, they are wetland types in which wetland indicators of one or more parameters may be periodically lacking due to normal seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events (Environmental Laboratory 1987). Prairie pothole wetlands in the Project Study Area are dominated by herbaceous communities, including water sedge (*Carex aquatilis*), clustered field sedge (*Carex praegracilis*), narrow spike reedgrass (*Calamagrostis stricta*), Baltic rush (*Juncus balticus*) and tufted hairgrass (*Deschampsia caespitosa*) as well as shrubby cinquefoil (*Dasiphora floribunda*) dominated shrublands (Cooper et al. 2001).

Besides being the main breeding area for many duck species, the prairie pothole region supports the primary breeding populations for eared, horned, and red-necked grebes, franklin's gull, Forster's terns, black terns, yellow-headed blackbirds, and Wilson's phalaropes. The playa wetlands are important as pairing habitat for ducks and migration habitat for transient shorebirds, then later become important nesting and foraging habitat for species such as short-eared owls, northern harriers, common snipe, and in some cases, LeConte's sparrows or yellow rails.

Prairie potholes occur throughout the Project Study Area; however, the potential to encounter prairie potholes declines in the southern portion of the Project Study Area where agricultural activities have impacted or eliminated many of these isolated wetlands. The most notable wetland within the Project Study Area is Benton Lake National Wildlife Refuge (NWR), located 12 miles north of Great Falls. The Refuge is located at the western edge of the farmed Prairie Pothole Region, an area characterized by millions of wetlands or potholes, which serve as the breeding ground for most of the Nation's waterfowl. Benton Lake NWR, covering 19 square miles, was established in 1929 as a refuge and breeding ground for birds.

Despite its name, Benton Lake is actually a 5,000-acre shallow wetland created by the last continental glacier thousands of years ago. During the late 1950's/early 1960's a pump house and pipeline were built to bring water to the Refuge from Muddy Creek. Dikes were built to divide the wetland into manageable units, and Refuge roads and facilities were constructed. Water still flows from the original pump station on Muddy Creek, but the Refuge wetlands have been further divided for more efficient water management.

Baseline

The following discussion describes the wetland distribution and potential occurrence for various wetlands along each of the three alternatives, as well as a direct comparison between the two northern border alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative). In accordance with *Circular MFSA-2* specific wetland criteria addressed in the Baseline section includes state/federal Waterfowl Production Areas [MFSA-2, 3.7.7.a; 3.7.12.b.viii]. *Circular MFSA-2* does not

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specifically require that water bodies 20 acres in size or larger be discussed or illustrated at the baseline level (1:24,000) level [MFSA-2, 3.4.1.u; 3.7.7.a]. However, water bodies 20 acres in size or larger crossed by the alternatives are discussed in this section although they are not included on a 1:24,000 overlay. Baseline overlays referenced in this section include the BioResources baseline overlays (**Figures E-1c through E-14c**), which contain the following data:

PLSS Grid
Field Surveyed Sharptail grouse leks
Agricultural Experiment Station
Bird Points
Class I/II Streams
Federal/State Managed Lands
Species of Concern
Mule Deer Winter Range
Prime Waterfowl Habitat
Mature Riparian Forest

Individual wetlands were identified according to NWI classification, size, and location. In order to avoid prairie potholes and other wetlands, field surveys were conducted to ground-truth the location of prairie potholes and wetlands within the three alternative route impact zones.

Preferred Alternative A

NWI data indicate there are six palustrine wetlands and one riverine wetland along the Preferred Alternative A route (**Table 4.5-12**). The majority of the wetlands occur north of Cut Bank and in the area east and south of Conrad. No NWI data exist for approximately 34 miles of the 129.9 miles of the route between Brady to just north of Benton Lake NWR, but our field investigation validated wetlands that occur or have been converted to agricultural fields in this area.

TABLE 4.5-12
LINEAR MILES OF WETLANDS ALONG THE TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

	Preferred Alternative A	Alternative B	Alternative C	Western Alt. Segment	Eastern Alt. Segment
Wetland Class	**Length (Miles)**	**Length (Miles)**	**Length (Miles)**	**Length (Miles)**	**Length (Miles)**
L2ABF	0.00	0.00	0.00	0.00	0.00
L2USA	0.00	0.00	0.00	0.00	0.00
L2USAd	0.00	0.00	0.00	0.00	0.00
PABF	0.00	0.01	0.00	0.00	0.00
PABFh	0.09	0.09	0.09	0.00	0.00
PABFx	0.00	0.00	0.00	0.00	0.00
PEMA	0.64	0.14	0.39	0.03	0.11
PEMAd	0.08	0.02	0.02	0.00	0.00
PEMAh	0.00	0.00	0.04	0.00	0.00
PEMB	0.09	0.00	0.03	0.00	0.00
PEMC	0.18	0.39	0.20	0.15	0.14
PEMCh	0.00	0.03	0.03	0.00	0.00
PEMF	0.00	0.02	0.00	0.00	0.00
PEMFh	0.00	0.02	0.00	0.00	0.00
PSSA	0.00	0.00	0.06	0.00	0.00
PUBFx	0.00	0.00	0.05	0.00	0.00
PUSA	0.02	0.00	0.00	0.00	0.02

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TABLE 4.5-12
LINEAR MILES OF WETLANDS ALONG THE TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

PUSAh	0.00	0.00	0.04	*0.00*	*0.00*
R3UBH	0.00	0.03	0.04	*0.00*	*0.00*
R3USC	0.04	0.04	0.00	*0.00*	*0.00*
Total Wetlands	1.14	0.77	0.99	*0.18*	*0.27*
U	106.49	98.77	118.02	*18.32*	*18.13*
No Data	22.26	24.89	17.48	*--*	*0.01*
Total Length of Alternative	129.89	124.43	136.49	*18.50*	*18.41*

Table 4.5-13 lists the water bodies 20 acres in size or larger that occur along or adjacent to each of the transmission line alternatives. No WPAs are located within 1 mile of Preferred Alternative A [MFSA-2, 3.7.12.b.viii].

TABLE 4.5-13
WATER BODIES 20 ACRES IN SIZE OR LARGER ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Water Body	Preferred Alternative A (miles)	Alternative B (miles)	Alternative C (miles)	*Western Alt. Segment*	*Eastern Alt. Segment*
PEMC/PUSA complex	--	--	--	--	--
Marias River	0.04	0.06	0.16	--	--
PEMC	0.03	0.09	--	*0.02*	*0.03*
PEMA/PEMC	--	--	0.11	--	--
Black Horse Lake Flat	--	0.02	0.29	--	--
L2ABF	--	0.18	--	--	--
PEMC/L2USA	--	0.04	--	--	--
PUSA	--	0.18	--	--	--
PEMB	--	0.19	--	--	--
PEMA	0.02	--	0.13	--	*0.02*
PEMAd	0.02	--	--	--	--
Total	0.11	0.76	0.69	*0.02*	*0.05*

Alternative B

NWI data indicate there are no lacustrine wetlands, eight palustrine wetlands, and two riverine wetlands along the Alternative B route (**Table 4.5-12**). The majority of the wetlands occur north of Cut Bank and in the area east and south of Conrad. No NWI data exist for approximately 25 miles of the 124 miles of the route between Brady to just north of Benton Lake NWR, but our field investigation validated wetlands that occur or have been converted to agricultural fields in this area.

Table 4.5-13 lists the seven water bodies 20 acres in size or larger that occur along or adjacent to Alternative B. No WPAs are located within 1 mile of Alternative B.

Alternative C

NWI data indicate there are no lacustrine wetlands, ten palustrine wetlands, and two riverine wetlands along the Alternative C route (**Table 4.5-12**). Similar to Preferred Alternative A and Alternative B, the majority of the wetlands occur north of Cut Bank and in the area east and

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south of Conrad. No NWI data exist for approximately 17 miles of the 136 miles of the route between Brady to just north of Benton Lake NWR, but our field investigation validated wetlands that occur or have been converted to agricultural fields in this area.

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Table 4.5-13 lists the four water bodies 20 acres in size or larger that occur along or adjacent to Alternative C. Peterson WPA, located in Glacier County northwest of Hay Lake, is within approximately 1.5 miles of Alternative C.

Western/Eastern Alternative Segments Comparison

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The 18.5 mile Western Alternative Segment from the Canadian Border southward crosses two palustrine wetlands. The 18.41 mile Eastern Alternative Segment from the Canadian Border southward crosses three palustrine wetlands.

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Environmental Consequences

The following discussion fulfills the baseline impact assessment requirements as outlined in *Circular MFSA-2*. Where possible these impacts would be reduced or avoided through the implementation of mitigation, avoidance, or environmental protection measures. Environmental Protection Measures are discussed in *Section 5.3*.
Due to the lack of substantive difference among the three alternative routes relative to wetland resources, potential impacts are discussed in aggregate for the entire Project Study Area and not by individual alternatives.

Factors considered in conducting the impact analysis include the nature of the wetland resource, the intensity, duration and frequency of impacts, and mitigation measures. All three alternatives have been sited in such a way as to specifically avoid placement of new structures within wetland boundaries. However, construction activities adjacent to wetlands may inadvertently impact wetland resources by:

Sedimentation and filling of waterways and wetlands as the result of exposed soils
Sediment tracking into roadways
Pollution through accidental hazardous material spill such as petroleum products, hydraulic fluid, antifreeze, etc.
Construction site litter and refuse
Revegetation/landscape materials and fertilizers
Airborne dust

Potential impacts to wetland resources would be mitigated or avoided by the implementation of erosion and sediment control best management practices (BMP's) as required by the State of Montana. The BMP's implemented would be part of the civil engineering process, and would be developed based on the specific soil disturbance conditions and the nature of the construction, operation and maintenance, or decommissioning. However, all three alternatives have been sited in such a way as to avoid any type of disturbance to wetlands.

4.5.3 Wildlife and Fisheries

The term "wildlife" as used in this document will include all vertebrates such as mammals, birds, reptiles, and amphibians. Data on wildlife and fisheries in the Project Study Area were obtained from a variety of sources, including literature review, reports from the MNHP and MFWP, technical reports, peer-reviewed journal articles, and field investigations conducted during May, June, and August 2005. Information and species lists were obtained through meetings and

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correspondence with personnel from the USFWS and MFWP. In particular, local wildlife biologists with the MFWP provided valuable information and mapping of sensitive species and important habitats. The potential for occurrence of wildlife species not observed during field investigations was assessed based upon evaluation of species distribution and habitat use, and information from previous research studies and biological reports. Threatened, endangered, proposed, and sensitive species found within the Project Study Area are discussed in Section 4.5.4.

Overview

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The following discussion describes the wildlife and fish distribution and potential habitat for various wildlife and fish species within the Project Study Area. In accordance with *Circular MFSA-2* the following specific information will be addressed in the Overview section:

Winter distribution of elk and mule deer within or adjacent to the Project Study Area [MFSA-2, 3.4.1.m, 3.7.7.a]
Waterfowl production areas [MFSA-2, 3.4.1.b, 3.7.7.a]
Grouse breeding areas and winter distribution [MFSA-2, 3.4.1.p, 3.7.7.a]
Prime waterfowl habitat [MFSA-2, 3.4.1.q, 3.7.7.a]

Two different sets of 1:100,000 scale overlays will be referenced in the Overview section. The Land Use/Land Cover set of overlays are labeled **Figure D-4-North** and **Figure D-4-South** and contains the following data:

Study Area Boundary
PLSS Grid
Developed Residential/Commercial/Industrial
Populated Areas
Military Installations
Federal/State Managed Land
Cropland by Irrigation Class
Non-Ag Grassland
Non-Ag Forestland
Open Water
U.S. Bureau of Reclamation Easements
Montana FWP Easements
USFWS Easements
Conservation Reserve Program Easements

The second set of overlays referenced in this section is the Wildlife Overview set of overlays. This set is labeled **Figure D-5-North** and **Figure D-5-South** and contains the following data:

Study Area Boundary
PLSS Grid
Field Surveyed Leks
Class I/II Fishery Streams
Sage Grouse Habitat
Elk Winter Range
Mule Deer Winter Range
Waterfowl Production Areas
Fishing Access Sites
Prime Waterfowl Habitat

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As discussed in *Section 4.5.1*, the Project Study Area encompasses the following Level IV ecoregions of Montana including: the North Central Brown Glaciated Plains, the Foothill Grassland, and the Milk River Pothole Upland (Woods et al. 1999). Within the Project Study Area, human development and conversion to agricultural cropland have fragmented the native vegetation communities and reduced the quality of these areas as habitat for grassland species (**Figures D-4-North** and **D-4-South**). The expanse of native grassland prairie and wetlands within Benton Lake NWR provides habitat for many wildlife. In fact, the wetland within Benton Lake NWR is considered prime waterfowl habitat (Johnson 2005) [MFSA-2, 3.4.1.q]. Thousands of tundra swans (*Cygnus columbianus*), and snow (*Chen caerulescens*) and Ross' geese (*Chen rossii*), stop at the Refuge for a week or more on their way from wintering grounds in central California to nesting areas in Arctic Alaska and Canada. In addition to the geese, are 20 species of ducks, including 12 species that stay to nest on the Refuge (USFWS 2000).

In addition to Benton Lake NWR, WPA's, CRP, river corridors, and the Kevin Rim are important wildlife habitats within the Project Study Area. The five WPA's provide habitat for wildlife, especially waterfowl (**Figure D-5-North** and **D-5-South**). CRP, which comprises approximately 17.7 percent of the Project Study Area, also provides valuable cover and forage for various species of wildlife. The Marias and Teton rivers represent the most significant fisheries in the Project Study Area, and the associated cottonwood gallery forests are the only sizeable woodlands in the area. The extent of a shrub-steppe community (silver sagebrush-western wheatgrass) is limited to the Kevin Rim in the northeast corner of the Project Study Area and lands southeast of Shelby north of the Marias River. The approximately 11 square miles of native shrub-grassland that occurs in the Kevin Rim area is relatively intact, and provides habitat for native wildlife species, including numerous birds.

Reptiles and Amphibians

Although fragmented by agricultural cropland, the upland, riparian, and aquatic communities within the Project Study Area may provide habitat for a variety of reptile and amphibian species. Field surveys were not conducted specifically for reptiles and amphibians during the spring and summer 2005; however, species distribution information suggests that 10 reptile and amphibian species are likely to occur in the Project Study Area (USFWS 2000). *Table 4.5-14* presents a list of reptiles and amphibians that are likely to occur based upon observations of habitat during field investigations, the Benton Lake NWR wildlife list, previous MNHP field studies, and the MNHP Animal Field Guide database. The greater short-horned lizard is classified as a sensitive species by BLM and has a State rank of S3. The MNHP did not have element occurrence data for this particular species of concern within the Project Study Area. The species listed in **Table 4.5-14** occupy a broad range of habitat types, ranging from ponds to mesic grasslands to xeric uplands, and may occur in appropriate habitats throughout the Project Study Area. No known critical breeding habitats or hibernacula for any reptile or amphibian species occurs within the Project Study Area.

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TABLE 4.5-14 REPTILE AND AMPHIBIAN SPECIES LIKELY TO OCCUR IN THE STUDY AREA[1] MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT		
Common Name	**Scientific Name**	**Habitat**
Reptiles		
Short-horned lizard[2]	Phrynosoma hernandesi	Sparse, short grass and sagebrush habitats with exposed soils or rock.
Racer	Coluber constrictor	Open habitats, particularly common in short-grass prairie.
Gopher snake	Pituophis catenifer	Arid sagebrush and grassland habitats.
Western Rattlesnake	Crotalus viridis	Open, arid habitats with south-facing slopes and rock outcrops.
Common Garter Snake	Thamnophis sirtalis	Numerous, prefer moist habitats along streams and ponds.
Western Terrestrial Garter Snake	Thamnophis elegans	Nearly all habitats.
Plains Garter Snake	Thamnophis radix	Numerous, including short-grass prairie near water (ponds and coulees).
Amphibians		
Tiger Salamander	Ambystoma tigrinum	Breeds in ponds and streams; burrows in prairie or agricultural habitats.
Western Chorus Frog	Pseudacris triseriata triseriata	Mesic grasslands and marshes near ponds and small lakes.
Painted Turtle	Chrysemys picta	Lakes, ponds, reservoirs, and sloughs that contain some shallow water areas and a soft bottom; also river backwaters and oxbows with little current.

[1] Source: MNHP 2004c.
[2] BLM: Sensitive; State rank: S3 - potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas.

Mammals

Mammal species found in the grasslands within the Project Study Area are numerous and include mule deer (*Odocoileus hemionus*), American pronghorn (*Antelocarpa americana*), badger (*Taxidea taxus*), Richardson's ground squirrel (*Spermophilus richardsonii)*, coyote (*Canis latrans*), mountain cottontail (*Sylvilagus nutalli*) and white-tailed jackrabbit (*Lepus townsendii*), and a variety of small rodents. These species are relatively common in grassland and sagebrush steppe habitats in northcentral Montana.

Badgers occur at low densities in grasslands throughout the Project Study Area. Richardson's ground squirrel occurs in relatively low to moderate densities (Olson 2005) within the Project Study Area, including several active ground squirrel burrows in the Kevin Rim area (Zelenak 1996). Black-tailed prairie dog (*Cynomys ludovicianus*) does occur in the Project Study Area east of I-15 and is further discussed in *Section 4.5.4*. Riparian habitats along the Marias River and Teton River support additional mammal species, including raccoons (*Procyon lotor*), red fox (*Vulpes vulpes*), and a variety of small rodents.

Ungulates

Mule deer occur in the Project Study Area south of the Marias River in low to moderate densities along coulees and draws. Figures D-5-North and D-5-South illustrates the winter distribution of mule deer within or adjacent to the Project Study Area [MFSA-2, 3.4.1.m]. The MNHP Animal Field Guide indicates that white-tailed deer (*Odocoileus virginianus*) are generally restricted to the southern portion of the Project Study Area, not reaching as far north as the

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Marias River (MNHP 2004c). However, landowners along the Marias River reported observing white-tailed deer in this area. The MNHP Animal Field Guide reports that within the southern portion of the Project Study Area white-tailed deer stay close to riparian habitats along the Teton River and its tributaries. Data indicate that white-tailed deer do not have winter ranges within the Project Study Area; however, the species' range east of the continental divide varies greatly from year to year depending on climatic conditions (MNRIS 2005).

American pronghorn occur in low to moderate densities throughout the central and southern portions of the Project Study Area. Pronghorn were observed in grasslands, sagebrush steppe, and agricultural croplands during field investigations. MNHP data indicate that pronghorn do not have a winter distribution within the Project Study Area (MNRIS 2005); however, pronghorn populations tend to fluctuate with environmental conditions. MNHP and MFWP data indicate that elk (*Cervus elaphus*) do not generally occur within the Project Study Area. The closest elk population is northeast of Shelby, outside the Project Study Area, in the Sweetgrass Hills. Figures D-5-North and D-5-South illustrates the winter distribution of elk adjacent to the Project Study Area [MFSA-2, 3.4.1.m].

Bats

The Project Study Area is within the known range of eight species of bats, representing one family and five genera (**Table 4.5-15**). All are insectivorous, preying upon nocturnal insects with highly evolved echolocation and foraging behavior, perhaps utilizing grasslands and riparian areas as foraging habitat. Some species are migratory, flying south for the winter (e.g.: Lasiurus cinereus, Lasionycteris noctivagans), while others flock to local caves or mines for the lengthy winter hibernation (e.g.: Myotis spp., Eptesicus fuscus). Migratory and wintering habits are poorly understood for many species. Townsend's big-eared bat is classified as a sensitive species by BLM and has a State rank of S2. The MNHP did not have element occurrence data for this particular species of concern within the Project Study Area.

TABLE 4.5-15
BAT SPECIES LIKELY TO OCCUR IN THE PROJECT STUDY AREA[1]

Common Name	Scientific Name	Roosting Habitat[2]	Status[3]	Migration[4]
Silver-haired bat	Lasionycteris noctivagans	Tree cavities in mature coniferous/mixed forest	C	Migratory
Hoary bat	Lasiurus cinereus	Trees	C	Migratory
Big brown bat	Eptesicus fuscus	Tree cavities, buildings	C	Not known
Townsend's big-eared bat[5]	Corynorhinus townsendii	Caves, abandoned mines	U	Year-round resident
Western small-footed myotis	Myotis ciliolabrum	Caves, abandoned mines, rock crevices	U	Not known
Long-eared myotis	Myotis evotis	Tree cavities and exfoliating bark in mature conifers	U	Not known
Little brown myotis	Myotis lucifugus	Buildings, trees, rock crevices	C	Probably migratory
Long-legged myotis	Myotis volans	Trees, buildings, rock crevices	U	Probably migratory

Based upon MNHP distribution data
[2] Primary hibernacula and roost habitats used by the species (Bat Conservation International 2002).
[3] General abundance/distribution in North America: C= common, U=uncommon (Bat Conservation International 2002).
[4] Current knowledge of migration status (Genter and Jurist 1995).
[5] State rank S2 – At risk because of very limited and/or declining numbers, range, and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.

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Due to local geologic and physiographic conditions, few if any caves or abandoned mines occur in the Project Study Area. Rock faces/crevices are found sparingly along parts of the Marias River and along the Kevin Rim. Accordingly, Townsend's big-eared bat and western small-footed myotis are unlikely to roost in the Project Study Area. Furthermore, the Project Study Area is at the distributional limits for these species and suitable roosting habitat does not exist in the area, thus the potential for occurrence of these species is relatively low. In fact, the only known location of Townsend's big-eared bat north of the Missouri River in northeastern Montana is in the Little Rocky Mountains (Hendricks et al. 2000).

The cottonwood gallery forests along the Marias River and Teton River represents potential roosting habitat for those species that roost in tree cavities and exfoliating bark. These species may occur in low densities given the limited availability of forested habitats within the Project Study Area. Habitat generalists are likely to be the most abundant bat species in the area given their capacity to utilize both natural and man-made structures for day and night roosts. No roosts or hibernacula are known to occur in the vicinity of the Project Study Area.

Birds

The vegetative communities provide habitat for a number of migratory and resident bird species within the Project Study Area. These species can generally be classified as upland game birds, grassland birds, waterfowl and shore birds, and raptors. The Marias River and Teton River cottonwood gallery forests represent the only large tracts of relatively contiguous forests in the Project Study Area and provide potential habitat for bird species that utilize forested and riparian habitats. The prairie grasslands along the river breaks and coulees provide potential habitat for a number of obligate grassland species. The five WPA's, Benton Lake NWR, and various prairie potholes provide potential habitat for waterfowl and shore birds.

Upland Game Birds

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Upland game bird species (Galliformes) known to occur in the Project Study Area include the ring-necked pheasant (*Phasianus colchicus*), the gray (Hungarian) partridge (*Perdix perdix*), and the sharp-tailed grouse (*Tympanuchus phasianellus*). Ring-necked pheasant and gray partridge habitat consists of a mosaic of open grasslands, cropland, and brushy cover. Extensive tracts of prairie grassland do not provide good pheasant habitat (Mussehl and Howell 1971). The species occurs throughout the Project Study Area, but primarily within the vicinity of waterways.

Although the greater sage grouse (*Centrocercus urophasianus*) is classified as sensitive by the BLM and sharp-tailed grouse is considered uncommon by the State, they are currently considered game species by MFWP, and are subject to a legal harvest season. Generally, the greater sage grouse is a sagebrush obligate that relies on big sagebrush habitats in all seasons. Due to the low occurrence of big sagebrush habitat (see *Section 4.5.1*), distribution data indicate that sage grouse do not occur within the Project Study Area. The closest distribution of sage grouse is near Tiber Reservoir along the Marias River (**Figure D-5-South**) [MFSA-2, 3.4.1.p].

Sharp-tailed grouse inhabit grasslands interspersed with woody draws and shrub coulees. The entire Project Study Area contains potential habitat for sharp-tailed grouse (MNRIS 2005). Except for areas close to the Marias River, Teton River, and Benton Lake NWR, the Project Study Area contains lower quality sharp-tailed grouse habitat due to habitat loss and fragmentation associated with agricultural activities. During field investigations a total of seven

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sharp-tailed leks were recorded. Three of the leks were observed visually and four leks were only auditory (**Figures D-5-North** and **D-5-South**) [MFSA-2, 3.4.1.p]. Although MFWP did not have specific locations of leks, they identified water crossings, draws, and coulees that are not cultivated as probable locations for leks within the Project Study Area, specifically Benton Lake National Wildlife Refuge, Marias River breaks (including where the Two Medicine River and Marias River come together), Teton River, east of Dutton along coulees and draws, and the Kevin Rim (Olson 2005).

Gary Olson, Region 4 biologist for Montana Fish, Wildlife, and Parks (MFWP) in Conrad identified shelterbelts and riparian areas as areas where sharp-tailed grouse concentrate during severe winters (Olson 2006). MT Natural Heritage Program cited the MFWP Bird Coordinator, Rick Northrup, as also identifying riparian and brush-covered areas as important to sharp-tail grouse during severe winters (Maxwell 2006). MFWP has not developed this information into a GIS layer that could be used to make a map. But, Olson reiterated that sharp-tailed grouse are widely distributed within the Project Study Area from the Canadian border south to Great Falls. He said field and homestead shelterbelts as well as native riparian areas, including brushy coulee bottoms, are where sharp-tailed grouse concentrate during severe winters.

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Shelterbelts and areas of shrub and tree cover, as described by Olson, are delineated on the Wildlife Overview overlays and the BioResources baseline overlays (Figures D-4 North, D-4 South; E-1c thru E-14c).

Grassland Birds

The intact mid- and short-grass prairie communities along the Marias River, Teton River, and several draws/coulees within the Project Study Area have been subjected to light-moderate grazing intensities and represent relatively high quality wildlife habitat. Several obligate grassland species may potentially occur in the aforementioned areas. MFWP identified the following grassland birds as having the potential to occur:

McCown's longspur (*Calcarius mccownii*);
Mountain plover (*Charadrius montanus*);
Sprague's pipit (*Anthus spragueii*);
Chestnut collared longspur (*Calcarius ornatus*); and
Baird's sparrow (*Ammodramus bairdii*).

None of the aforementioned species were observed during field investigations. All five of these species are identified by the state as species of concern. One of the five species, Baird's sparrow, was identified by the MNHP as known to occur within the Project Study Area and is discussed further in *Section 4.5.4*. The quality and relative intactness of the grassland prairie habitats declines with distance away from the Marias and Teton rivers due to increasing agricultural land uses. The sagebrush steppe vegetation in the Kevin Rim portion of the Project Study Area provides habitat for a number of bird species that rely on sagebrush-grassland communities.

Waterfowl and Shore birds

A number of waterfowl species are known to occur in the Project Study Area, the majority of which have been observed on Benton Lake NWR (**Table 4.5-16**). Breeding bird surveys on Benton Lake NWR have documented 20 species of ducks, including 12 species that stay to nest

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on the Refuge (USFWS 2000). Waterfowl habitat within the Project Study Area includes wetlands, stock ponds, the Marias River, and the Teton River. Wetlands and stock ponds tend to be small and isolated. Since most stock ponds lack emergent and/or wetland vegetation, nesting habitat is limited. Surface waters that possess potential nesting habitat include Benton Lake, Hay Lake, five WPA's, and a few of the larger, undisturbed prairie potholes. The Marias and Teton rivers also provide waterfowl habitat, although hydrological changes and channel incision have reduced the availability of quality nesting habitat along both rivers. Riparian communities along ephemeral streams that bisect the Project Study Area do not provide quality waterfowl habitat. Wetlands, stock ponds, Hay Lake, Marias and Teton rivers, and Benton Lake NWR also provide stopover habitat for migrating waterfowl.

Approximately 32 species of shore birds are known to occur in the Project Study Area, primarily on Benton Lake NWR (**Table 4.5-16**). These species nest in native grassland prairie habitats in proximity to mesic grasslands or shallow wetlands. Habitat for these species occurs primarily in the northern and central portions of the Project Study Area where native prairie grasslands are interspersed with small ponds, wetlands, and riparian areas. Habitat for other shore bird species includes the wetlands and stock ponds that are dispersed throughout the Project Study Area. The small size and lack of emergent wetland vegetation in most of the water bodies reduces their quality as shore bird habitat. The Marias and Teton rivers and adjacent areas also represent potential shore bird habitat.

TABLE 4.5-16
WATERFOWL AND SHORE BIRDS SIGHTED ON BENTON LAKE NWR SINCE 1961
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Shore birds	Swans, Geese, and Ducks
Black-bellied Plover	Tundra Swan (Whistling Swan)
American Golden Plover (Lesser Gol-Pl.)	Trumpeter Swan
Semi-palmated Plover	Greater White-fronted Goose
Piping Plover	Snow Goose
Killdeer	Ross' Goose
Black-necked Stilt*	Canada Goose*
American Avocet*	Wood Duck
Greater Yellowlegs	Green-winged Teal*
Lesser Yellowlegs	American Black Duck
Solitary Sandpiper	Mallard*
Willet	Northern Pintail*
Spotted Sandpiper*	Blue-winged Teal*
Upland Sandpiper*	Cinnamon Teal*
Whimbrel	Northern Shoveler*
Long-billed Curlew*	Gadwall*
Hudsonian Godwit	Eurasian Wigeon
Marbled Godwit*	American Wigeon*
Ruddy Turnstone	Canvasback*
Red Knot	Redhead*
Sanderling	Ring-necked Duck
Semipalmated Sandpiper	Greater Scaup
Western Sandpiper	Lesser Scaup*
Least Sandpiper	Oldsquaw
Baird's Sandpiper	White-winged Scoter

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TABLE 4.5-16 WATERFOWL AND SHORE BIRDS SIGHTED ON BENTON LAKE NWR SINCE 1961 MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Pectoral Sandpiper	Common Goldeneye
Dunlin	Barrow's Goldeneye
Stilt Sandpiper	Bufflehead
Short-billed Dowitcher	Hooded Merganser
Long-billed Dowitcher	Common Merganser
Common Snipe	Red-breasted Merganser
Wilson's Phalarope*	Ruddy Duck*
Red-necked Phalarope	

Raptors

A number of raptor species are known to occur to in the Project Study Area, and have been observed during breeding bird surveys and field investigations conducted for this project. The Kevin Rim Area of Critical Environmental Concern (ACEC) and the Marias River breaks provide potential habitat for raptors. A list of raptors observed by other researchers along Kevin Rim from 1993-1994 is presented in Table 4.5-17 (Zelenak 1996).

TABLE 4.5-17
RAPTORS OBSERVED AT THE KEVIN RIM, 1993-1994[1]
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Common Name	Scientific Name
Ferruginous hawk	Buteo regalis
Prairie falcon	Falco mexicanus
American kestrel	Falco sparverius
Red-tailed hawk	Buteo jamaicensis
Golden eagle	Aquila chrysaetos
Swainson's hawk	Buteo swainsoni
Great-horned owl	Bubo virginianus
Burrowing owl	Athene cunicularia
Northern harriers	Circus cyaneus
Short-eared owls	Asio flammeus

[1] Source: Zelenak 1996

While these species are present in the Project Study Area during breeding season, potential nesting sites, aside from Kevin Rim and the bluffs around the Marias River, are limited to small shrubs in draws and coulees, riparian cottonwood trees, and ornamental spruce trees near farms or residential areas (Olson 2005). An historic peregrine falcon eyrie is located where Cut Bank Creek and Two Medicine River flow together to form the Marias River. The eyrie is discussed further in Section 4.5.4. Cottonwood gallery forest along the Marias and Teton rivers is used by bald eagles during the winter, and indirect evidence of breeding has been observed in these areas (MNHP 2005). Bald eagles and peregrine falcons are often seen in the spring on Benton Lake NWR (USFWS 2000).

Potential raptor prey sources include colonial rodents, lagomorphs, waterfowl, and carrion. Although prey populations in the Project Study Area have not been assessed, prey densities are generally low (Olson 2005). Ground squirrels comprised the majority of prey items recorded in

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ferruginous hawk nests in 1993 and 1994, followed by lagomorphs and birds (Zelenak 1996). A black-tailed prairie dog town is known to exist east of I-15 southeast of Shelby north of the Marias River. Rabbits and hares are common and, while these populations are subject to significant annual fluctuations, field investigations indicated that current lagomorph densities are relatively low. The five WPA's provide waterfowl concentration areas, which may serve as raptor prey sources. Carrion is available on ungulate winter ranges where bald eagles and other scavengers are attracted to the area by over-winter mortalities (Olson 2005). Dead livestock may also provide carrion for scavenging raptors.

Migratory Birds

The Project Study Area contains rolling hills, gentle ridges, and plateaus bisected by small drainages. There are no obvious "funnels," such as prominent ridgelines or mountain gaps that could potentially serve as a large scale or regional migratory pathway. The relatively small ridges within the Project Study Area may serve as local pathways for birds passing through as part of a large, broad front migration. Thousands of tundra swans, and snow and Ross' geese, stop at the Benton Lake NWR for a week or more on their migration from their wintering grounds in central California to nesting areas in arctic Alaska and Canada. Twenty species of ducks, including 12 species that stay to nest on the Refuge, also migrate through this area. Aside from Benton Lake NWR, a limited amount of stopover habitat for migrating waterfowl is available within the Project Study Area (Johnson 2005). The five WPA's provide some habitat, but are not likely to attract large numbers of waterfowl given the proximity of Benton Lake NWR and Tiber Reservoir. Riparian habitats can also provide stopover habitat for neotropical migrants. Examples of neotropical migrant birds includes species of plovers, terns, hawks, cranes, warblers and sparrows.

Fish

The Project Study Area crosses one sub-basin of the Milk Watershed and seven sub-basins of the Marias Watershed. The sub-basins crossed are: Upper Missouri-Dearborn Rivers, Sun River, Teton River, Marias River, Two Medicine River, Willow Creek, and Cut Bank Creek sub-basins in the Marias Watershed and the Upper Milk River sub-basin in the Milk Watershed.
Across the Project Study Area are several intermittent gulches, coulees, creeks, and rivers. The majority of the water bodies act as tributaries to three major rivers within the study area: the Marias River, the Teton River, and the Missouri River. Both the Marias and Teton rivers drain into the Missouri River.

The gulches and coulees within the Project Study Area are typically dry during the summer and do not support fisheries. Lakes are predominately man-made stock ponds, reservoirs, or prairie potholes. Water bodies and lakes that hold water year-round are generally capable of supporting both warm-water and cold-water fish species (**Table 4.5-18**).

Four fish species identified within the Project Study Area are listed by the MNHP as threatened, endangered, or of special concern under the Montana Endangered Species Act. These species are discussed further in *Section 4.5.4*. The only water body identified by the MFWP as a blue ribbon or red ribbon river in the Project Study Area is the Missouri River. The river miles at which all three alternatives cross the Marias and Teton rivers are considered Habitat Class 3 and Sport Class 4 fisheries.

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TABLE 4.5-18 FISH SPECIES KNOWN TO OCCUR WITHIN THE PROJECT STUDY AREA MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT					
Game Fish		**Rough Fish/Non-Game Fish**		**Forage Fish**	
Common Name	Scientific Name	Common Name	Scientific Name	Common Name	Scientific Name
Brown Trout	*Salmo trutta*	Common Carp	*Cyprinus carpio*	Emerald Shiner	*Notropis atherinoides*
Brook Trout	*Salvelinus fontinalis*	Bigmouth Buffalo	*Ictiobus cyprinellus*	Fathead Minnow	*Pimephales promelas*
Rainbow Trout	*Oncorhynchus mykiss*	Freshwater Drum	*Aplodinotus grunniens*	Flathead Chub	*Platygobio gracilis*
Burbot	*Lota lota*	River Carpsucker	*Carpiodes carpio*	Lake Chub	*Couesius plumbeus*
Channel Catfish	*Ictalurus punctatus*	Shorthead Redhorse	*Moxostoma macrolepidotum*	Longnose Dace	*Rhinichthys cataractae*
Northern Pike	*Esox lucius*	Smallmouth Buffalo	*Ictiobus bubalus*	Longnose Sucker	*Catostomus catostomus*
Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	Golden Trout	*Oncorhynchus mykiss aguabonita*	Mottled Sculpin	*Cottus bairdi*
Walleye	*Sander vitreus*	Paddlefish[1]	*Polyodon spathula*	Mountain Sucker	*Catostomus platyrhynchus*
Yellow Perch	*Perca flavescens*			Mountain Whitefish	*Catostomus platyrhynchus*
Smallmouth Bass	*Micropterus dolomieu*			White Sucker	*Catostomus commersoni*
Mountain Whitefish	*Prosopium williamsoni*			Goldeye	*Hiodon alosoides*
Sauger[1]	*Sander canadensis*			Plains Minnow	*Hybognathus placitus*
Sauger X Walleye Hybrid				Blue Sucker[1]	*Cycleptus elongatus*
				Spottail Shiner	*Notropis hudsonius*
				Western Silvery Minnow	*Hybognathus argyritis*
				Sturgeon Chub[1]	*Macrhybopsis gelida*
				Stonecat	*Noturus flavus*
				Cisco	*Coregonus artedi*

[1] Species listed by the Montana Natural Heritage Program as threatened, endangered, or of special concern under the Montana Endangered Species Act.
Source: Montana Fisheries Information System Database.

Baseline

The following discussion describes wildlife and fish distribution, and potential habitat for various wildlife and fish species along the three alternative routes, as well as a direct comparison between the two northern border alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative). Refer to Section 2.2 for an explanation of the information requirements that were dismissed. In accordance with *Circular MFSA-2* the following specific information will be addressed in the Baseline section:

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Winter distribution of elk and mule deer within or adjacent to the Project Study Area [MFSA-2, 3.7.7.a, 3.7.12.b.xv]
Waterfowl production areas [MFSA-2, 3.7.7.a, 3.7.12.b.viii]
Grouse breeding areas and winter distribution [MFSA-2, 3.7.7.a, 3.7.12.b.xviii]
Prime waterfowl habitat [MFSA-2, 3.7.7.a, 3.7.12.b.xix]
Nesting colonies [MFSA-2, 3.7.12.b.xxii]

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Raptor nests [MFSA-2, 3.7.12.b.xxiv]

A set of 1:24,000 scale overlays has been created for the Baseline section titled *BioResources (*Figure E-1c through Figure E-14c*)*. This set of overlays contains the following data:

PLSS Grid
Field Surveyed Sharptail grouse leks
Agricultural Experiment Station
Bird Points
Class I/II Streams
Federal/State Managed Lands
Species of Concern
Mule Deer Winter Range
Prime Waterfowl Habitat
Mature Riparian Forest

Field investigations were conducted in May, July, and August 2005 to evaluate biological resources in the vicinity of the proposed alternative transmission line routes. Information on vegetative communities, wetlands, wildlife habitats, and actual/potential species occurrence was obtained through these field investigations. The potential for occurrence of wildlife and fish species not observed during field investigations was assessed based upon evaluation of species distribution and habitat use, and information from previous research studies and biological reports.

A list of wildlife species observed during field investigations is presented in **Table 4.5-19**. This table is not intended to be an exhaustive list of every species that occurs in the area, but rather to provide insight into current habitat conditions and general taxonomic groups that occur within the Project Study Area. The following sections provide discussions of various wildlife species that occur in the Project Study Area. Species of concern are discussed in *Section 4.5.4*.

TABLE 4.5-19
SPECIES OBSERVED IN THE PROJECT STUDY AREA DURING FIELD INVESTIGATIONS
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Common Name	Scientific Name	Location
Birds		
Golden eagle	*Aquila chrysaetos*	West of Benton Lake NWR
Northern harrier	*Circus cyaneus*	West of Benton Lake NWR
Swainson's hawk	*Buteo swainsoni*	West of Benton Lake NWR; Bullhead Rd.; Kevin Rim
Red-tailed hawk	*Buteo jamaicensis*	West of Benton Lake NWR; Bullhead Rd.; north of Teton River
Ring-necked pheasant	*Phasianus colchicus*	McLean State Game Preserve; Bullhead Rd.
Sharp-tailed grouse	*Tympanuchus phasianellus*	West of Benton Lake NWR; Marias River; north of Shelby
Horned lark	*Eremophila alpestris*	North of Marias River
Meadow lark	*Sturnella neglecta*	Throughout
Common snipe	*Gallinago gallinago*	McLean State Game Preserve
Long-billed curlew	*Numenius americanus*	Throughout
Northern Shoveler	*Anas clypeata*	North of Cut Bank
Blue-winged Teal	*Anas discors*	North of Cut Bank
Mallard	*Anas platyrhynchos*	North of Cut Bank
Gray (Hungarian) Partridge	*Perdix perdix*	Kevin Rim; McLean State Game Preserve

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TABLE 4.5-19 SPECIES OBSERVED IN THE PROJECT STUDY AREA DURING FIELD INVESTIGATIONS MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT		
Mammals		
Coyote	*Canis latrans*	South of Cut Bank
American pronghorn	*Antelocapra Americana*	Throughout
White-tailed jackrabbit	*Lepus townsendii*	Kevin Rim
Red fox	*Vulpes vulpes*	Bullhead Rd.
Mountain cottontail	*Sylvilagus nutalli*	Kevin Rim
Mule deer	*Odocoileus hemionus*	North of Teton River

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Preferred Alternative A

Community types crossed by Preferred Alternative A provide potential habitat for birds, raptors, mammals, reptiles, and amphibians. Approximately 10 percent of this route crosses through non-farmland mostly in the form of low to moderate cover grasslands that provide habitat for grassland obligate bird species. These grasslands are mostly found above the Marias and Teton rivers. Mature cottonwood forest, particularly along the Marias and Teton rivers, represent potential perching and/or nesting habitat for the bald eagle and other raptors. Preferred Alternative A does not cross through mature cottonwood forest, but spans the rivers where gaps in the forest exist.

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Mule Deer

Mule deer were observed during field investigations along Preferred Alternative A near the Teton River. Mule deer distribution and winter range was further evaluated using Montana NRIS data (MNRIS 2005). Preferred Alternative A crosses through approximately 19.4 miles of mule deer winter range (Table 4.5-20) along the Marias River, Dry Fork Marias River, Pondera Coulee, Teton River, and Missouri River drainages [MFSA-2, 3.7.12.b.xv].

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TABLE 4.5-20 LINEAR MILES OF MULE DEER WINTER RANGE CROSSED BY EACH ALTERNATIVE MONTANA ALBERTA TIE. LTD.				
Preferred Alternative A	**Alternative B**	**Alternative C**	*West Alt. Segment*	*East Alt. Segment*
19.39	20.06	21.12	*0.00*	*0.00*

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Sharp-tailed Grouse

Potential sharp-tailed grouse habitat along this alternative is patchy due to fragmentation by agricultural land. The primary suitable habitat along Preferred Alternative A is within the grasslands above the Marias River where two leks were observed and two leks were audible. A total of 3 leks are within the 1 mile impact zone of this route [MFSA-2, 3.7.12.b.xviii]. Although no leks were observed above the Teton River during field investigations, the area where this route would cross the Teton is potential sharp-tailed habitat.

Raptors

Surveys were conducted for nests of raptorial birds within 0.5 mile of Preferred Alternative A. No raptor nests were found. MFWP biologists did not know any specific locations of raptor nests along the route of Preferred Alternative A [MFSA-2, 3.7.12.b.xxiv]. However, an MFWP biologist said Swainson's hawks and red-tailed hawks are known to nest in cottonwood trees (Olson 2005b). Therefore, it is likely that raptor nests exist in the cottonwood trees along the

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Marias and Teton rivers near where Preferred Alternative A crosses. These species are also known to nest in ornamental spruce trees near residential homes and farms (Olson 2005b).

Waterfowl

Preferred Alternative A does not come within 1 mile of any of the five WPA's, Benton Lake NWR, or any known nesting colonies in the Project Study Area [MFSA-2, 3.7.7a, 3.7.12.b.vii, 3.7.12.b.xix]. This route traverses across land to the east of the Benton Lake NWR boundary.

Benton Lake NWR is considered prime waterfowl habitat by the USFWS (Johnson 2005). However, prime waterfowl habitat is not found within the 1-mile impact zone of Alternative A. Overall, Alternative A does not come within 1 mile of any known nesting colonies in the Project Study Area [MFSA-2, 3.7.7a, 3.7.12.b.vii, 3.7.12.b.xix]. Specifically, nesting colonies of white pelicans, great blue herons, or double-crested cormorants are not known to occur within the 1-mile impact zone of any of the three alternatives (Olson 2005 and Johnson 2005). Biologists with both the MFWP and the USFWS did not have any hard data on nesting colonies within the 1-mile impact zone of Alternative A [MFSA-2, 3.7.12b.xxii]

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Fish

Preferred Alternative A would cross 22 distinct drainages or water bodies and 3 wetland areas. Several coulees would be crossed multiple times. The drainages and water bodies that would be crossed are 13 coulees, 2 unnamed streams, 3 creeks, and 4 rivers. Of the water bodies within the Project Study Area, only the Marias River, Dry Fork Marias River, Teton River, and Railroad Coulee were known to have fish populations (MFIS 2005). While the exact crossing locations vary between the three alternatives, the fish species occurrences are the same (MFIS 2005). **Table 4.5-21** identifies the fish species that occur in the water bodies crossed by all three alternatives.

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Common species found in the water bodies crossed by Preferred Alternative A include: walleye, common carp, shorthead redhorse, emerald shiner, flathead chub, longnose dace, white sucker, and goldeneye.

TABLE 4.5-21
FISH SPECIES PRESENT IN THE WATER BODIES CROSSED BY ALL THREE ALTERNATIVES
MONTANA ALBERTA TIE, LTD.

Fish Species	Railroad Coulee	Marias River	Dry Fork Marias River	Teton River
Brown Trout	✓	✓		✓
Brook Trout	✓			✓
Rainbow Trout	✓	✓		
Burbot		✓	✓	
Channel Catfish		✓		✓
Northern Pike		✓		✓
Shovelnose Sturgeon		✓		✓
Walleye		✓		
Yellow Perch		✓		
Sauger[1]				✓
Common Carp		✓		✓
River Carpsucker				✓
Shorthead Redhorse				✓
Emerald Shiner		✓		✓

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TABLE 4.5-21
FISH SPECIES PRESENT IN THE WATER BODIES CROSSED BY ALL THREE ALTERNATIVES
MONTANA ALBERTA TIE, LTD.

Fathead Minnow		✓		✓
Flathead Chub		✓		✓
Lake Chub		✓	✓	
Longnose Dace		✓	✓	✓
Longnose Sucker		✓	✓	✓
Mottled Sculpin		✓		✓
Mountain Sucker		✓		✓
Mountain Whitefish		✓		✓
White Sucker		✓	✓	✓
Goldeye				✓
Blue Sucker[1]				✓
Spottail Shiner				
Sturgeon Chub[1]				✓
Stonecat				✓

[1] These species are listed by the Montana Natural Heritage Program as threatened, endangered, or special concern under the Montana Endangered Species Act.
Source: Montana Fisheries Information System Database.

Alternative B

Community types crossed by Alternative B are extremely similar to those crossed by Preferred Alternative A (**Table 4.5-5**) and provide potential habitat for birds, raptors, mammals, reptiles, and amphibians. Special status species likely to occur along the route are discussed in *Section 4.5.4*. Approximately 7.6 percent of Alternative B traverses non-farmland mostly in the form of low to moderate cover grasslands that provide habitat for grassland obligate bird species. Similar to Preferred Alternative A these grasslands are not contiguous and are mostly found above the Marias and Teton rivers.

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Mule Deer

Mule deer were observed during field investigations along Alternative B near the Teton River. Mule deer distribution and winter range was further evaluated using Montana NRIS data (MNRIS 2005). Alternative B crosses through approximately 20 miles of mule deer winter range (**Table 4.5-20**) along the Marias River, Dry Fork Marias River, Pondera Coulee, Teton River, and Missouri River drainages [MFSA-2, 3.7.12.b.xv].

Sharp-tailed Grouse

Potential sharp-tailed grouse habitat along this alternative is patchy due to fragmentation by agricultural land. The primary suitable habitat along Alternative B is within the grasslands above the Marias River where two leks were observed and two leks were audible. Two leks are within the 1-mile impact zone of this route [MFSA-2, 3.7.12.b.xviii]. Although no leks were observed above the Teton River during field investigations, the area where this route would cross the Teton is potential sharp-tailed habitat.

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Raptors

Surveys were conducted for nests of raptorial birds within 0.5 mile of Alternative B. No raptor nests were found. MFWP biologists did not know any specific locations of raptor nests along the route of Alternative B [MFSA-2, 3.7.12.b.xxiv]. However, an MFWP biologist said Swainson's hawks and red-tailed hawks are known to nest in cottonwood trees (Olson 2005b). Therefore, it is likely that raptor nests exist in the cottonwood trees along the Marias and Teton rivers near where Alternative B crosses. These species are also known to nest in ornamental spruce trees near residential homes and farms (Olson 2005b).

Waterfowl

Alternative B does not come within 1 mile of any of the five WPA's, Benton Lake NWR, or any known nesting colonies in the Project Study Area [MFSA-2, 3.7.7a, 3.7.12.b.vii, 3.7.12.b.xix]. This route traverses across land to the east of the Benton Lake NWR boundary.

Benton Lake NWR is considered prime waterfowl habitat by the USFWS (Johnson 2005). However, prime waterfowl habitat is not found within the 1-mile impact zone of Alternative B). Overall, Alternative B does not come within 1 mile of any known nesting colonies in the Project Study Area [MFSA-2, 3.7.7a, 3.7.12.b.vii, 3.7.12.b.xix]. Specifically, nesting colonies of white pelicans, great blue herons, or double-crested cormorants are not known to occur within the 1-mile impact zone of any of the three alternatives (Olson 2005 and Johnson 2005). Biologists with both the MFWP and the USFWS did not have any hard data on nesting colonies within the 1-mile impact zone of Alternative B [MFSA-2, 3.7.12b.xxii]

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Fish

Alternative B would cross 16 coulees, 2 creeks, 4 rivers, and 3 wetlands. Of the 25 water bodies within the impact zone for Alternative B, only the following 4 were known to have fish populations: Railroad Coulee, Marias River, Dry Fork Marias River, and Teton, River (MFIS 2005). **Table 4.5-21** identifies the fish species that occur in the water bodies crossed by all three alternatives. Common species found in the water bodies crossed by Alternative B include: walleye, common carp, shorthead redhorse, emerald shiner, flathead chub, longnose dace, white sucker, and goldeneye.

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Alternative C

Community types crossed by Alternative C are similar to those crossed by Preferred Alternative A and Alternative B, with the exception of the southern half of the route where it extends east and then south to cross the Teton River (**Table 4.5-5**). Community types along Alternative C provide potential habitat for birds, raptors, mammals, reptiles, and amphibians. Special status species likely to occur along the route are discussed in *Section 4.5.4*. Approximately 6 percent of Alternative C traverses non-farmland mostly in the form of low to moderate cover grasslands that provide habitat for grassland obligate bird species. Similar to Preferred Alternative A and Alternative B these grasslands are not contiguous and are mostly found above the Marias and Teton Rivers.

Mule Deer

Mule deer were observed during field investigations along Alternative C near the Teton River. Mule deer distribution and winter range was further evaluated using Montana NRIS data (MNRIS 2005). Alternative C crosses through approximately 19.86 miles of mule deer winter

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range (**Table 4.5-20**) along the Marias River, Dry Fork Marias River, Pondera Coulee, Teton River, and Missouri River drainages [MFSA-2, 3.7.12.b.xv].

Sharp-tailed Grouse

Potential sharp-tailed grouse habitat along this alternative is patchy due to fragmentation by agricultural land. The primary suitable habitat along Alternative C is within the grasslands above the Marias River where two leks were observed and two leks were audible. One lek was within 1 mile of this route [MFSA-2, 3.7.12.b.xviii]. Although no leks were observed above the Teton River during field investigations, the area where this route would cross the Teton is potential sharp-tailed habitat.

Raptors

The mature cottonwood forest, particularly along the Marias River and Teton River, represent potential perching habitat for the bald eagle and other raptors. Alternative C does not cross through mature cottonwood forest, but spans the rivers where gaps in the forest exist. Surveys were conducted for nests of raptorial birds within 0.5 mile of Alternative C. No raptor nests were found. MFWP biologists did not know any specific locations of raptor nests along the route of Alternative C [MFSA-2, 3.7.12.b.xxiv]. However, an MFWP biologist said Swainson's hawks and red-tailed hawks are known to nest in cottonwood trees (Olson 2005b). Therefore, it is likely that raptor nests exist in the cottonwood trees along the Marias and Teton rivers near where Alternative C crosses. These species are also known to nest in ornamental spruce trees near residential homes and farms (Olson 2005b).

Waterfowl

Peterson WPA, located in Glacier County northwest of Hay Lake, is within approximately 1.5 miles of Alternative C. Benton Lake NWR is considered prime waterfowl habitat by the USFWS (Johnson 2005). However, prime waterfowl habitat is not found within the 1-mile impact zone of Alternative C). Overall, Alternative C does not come within 1 mile of any known nesting colonies in the Project Study Area [MFSA-2, 3.7.7a, 3.7.12.b.vii, 3.7.12.b.xix]. Specifically, nesting colonies of white pelicans, great blue herons, or double-crested cormorants are not known to occur within the 1-mile impact zone of any of the three alternatives (Olson 2005 and Johnson 2005). Biologists with both the MFWP and the USFWS did not have any hard data on nesting colonies within the 1-mile impact zone of Alternative C [MFSA-2, 3.7.12b.xxii]

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Fish

Alternative C would cross 12 coulees, 3 creeks, 1 lake, 1 wetland, and 4 rivers. Of the 21 water bodies within the impact zone for Alternative C, only the following 4 were known to have fish populations: Railroad Coulee, Marias River, Dry Fork Marias River, and Teton River (MFIS 2005). **Table 4.5-21** identifies the fish species that occur in the water bodies crossed by all three alternatives. Common species found in the water bodies crossed by the Alternative C include: walleye, common carp, shorthead redhorse, emerald shiner, flathead chub, longnose dace, white sucker, and goldeneye.

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Environmental Consequences

Potential adverse impacts to wildlife associated with development of the transmission line can be separated into impacts associated with project construction and those related to operations and maintenance (**Table 4.5-22**). The primary potential adverse impacts include direct

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mortality, habitat loss and fragmentation, disturbance and displacement of individual animals, interference with behavioral activities, and disturbance resulting from increased public access. Effects associated with increased potential for exposure to contaminants, generation of fugitive dust, and fire risk are discussed in Section 4.5.1.

TABLE 4.5-22
POTENTIAL EFFECTS OF TRANSMISSION LINE PROJECT ON WILDLIFE
MONTANA ALBERTA TIE, LTD.

Transmission Line Construction, Operation, and Maintenance			
Impact	**Associated Project Activities**	**Potential Effects and Taxa Affected**	**Effect Extent and Duration**
Direct injury and/or mortality	Site clearing and grading; construction of access roads and support facilities; storage and off-road travel during construction.	Mortality and injury of species that burrow or have limited mobility; destruction of nests/eggs.	Temporary (duration of construction); within and adjacent to construction sites and storage areas.
Habitat loss and fragmentation	Site clearing and grading; construction of access roads and support facilities.	Loss and fragmentation of existing habitat for all wildlife species.	Permanent habitat loss within footprints of power poles, access roads, and support facilities.
Disturbance and behavioral interference	Noise and human presence associated with site clearing, grading, and construction of access roads and support facilities; construction vehicles.	Displacement from and avoidance of construction areas; disturbance of foraging, migration, and breeding behaviors; all wildlife species.	Temporary disturbance (duration of construction) within power pole placement and along access roads.
Exposure to contaminants	Accidental spill during equipment maintenance and refueling.	Exposure may affect survival, reproduction, development, or growth; all wildlife species.	Temporary (duration of construction); localized to spill site.
Generation of fugitive dust	Site clearing and grading; construction of poles, access roads, and support facilities; vehicles.	Respiratory impairment; all wildlife species.	Temporary (duration of construction); in immediate vicinity of access roads and construction sites.
Erosion and sedimentation	Site clearing and grading; construction of poles, access roads, and support facilities.	Degradation of aquatic habitats; amphibians, waterfowl, and fish.	Temporary (duration of construction); may extend beyond site boundaries.
Legal and illegal take of wildlife	Increases public access via new roads and transmission corridors.	Impacts to wildlife habitats; increased disturbance and mortality; all wildlife species.	Temporary and permanent; along transmission line corridor.
Fire	Access by maintenance vehicles and unauthorized vehicles.	Habitat loss of native species and establishment of non-native vegetation.	Permanent; in vicinity of access roads.
Bird strikes	Operation	Impacts to bird species, especially waterfowl.	Permanent.
Increased potential for raptor predation	Operation	Impacts to raptor prey (other birds and small mammals) due to hunting perches on poles.	Permanent.

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Operation and Avian Collision Impacts

Operation of the proposed transmission line would have the greatest impact on bird species, due to the collision threat posed by structures, transmission lines, and ground wires. Most other wildlife species would not be as impacted, since the presence of the transmission lines, structures, and access roads generally does not present barriers to migration, create excessive noise, or otherwise cause major behavior changes. Some species with small home ranges or limited dispersal ability might experience a greater negative impact. Some bird species, usually waterfowl, are prone to collisions with power lines, especially the grounding wires located at the top of the structures (Meyer 1978, James and Haak 1979, Beaulaurier 1981, Beaulaurier et al. 1982, Faanes 1987).

Four main factors influence avian transmission line collisions: the current level of risk, power line configuration, amount of bird use in a particular area, and the tendency of certain bird species to collide with wires. Collisions usually occur near water or migration corridors and more often during inclement weather. Raptor species are less likely to collide with power lines, perhaps due to their excellent eyesight and tendency to not fly at dusk or in low visibility weather conditions (Olendorff and Lehman, 1981). Smaller migratory birds are at risk, but generally not as prone to collision because of their small size, their ability to quickly maneuver away from obstacles, and the fact that they often migrate high enough above the ground to avoid transmission lines. Permanent-resident birds that fly in tight flocks, particularly those in and near wetland areas, may be at higher risk than other species.

New transmission lines could potentially impact large birds, such as raptors through electrocution. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. MATL transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution. Furthermore, raptors may use the davit arm transmission structures as perches while scouting for food. Concerns have been raised in some circumstances that the raptors could impact the prairie nesting bird population due to this. There are few studies on this issue and no consistent position by the agencies. The proposed route segments do not go through any major prairie bird nesting area and should not provide an opportunity for raptors to prey on those types of birds more than normal.

Avian Collision Mitigation

Where possible, line up new structures with existing structures to minimize vertical separation between sets of transmission lines. Install appropriate line markers/bird flight diverters in high risk areas, such as crossings of the Marias River, the Dry Fork Marias River, Teton River, east of the Benton Lake NWR boundary; and high ridge crossings such as the Benton Bench northwest of Conrad. Monitor potential problem areas after construction to ensure that line markers are functioning properly. Use of raptor perch deterrents near active sharp-tailed leks.

Raptor-safe Power Line Construction Practices

- MATL would apply *Suggested Practices for Raptor Protection on Power Lines*, developed by the Edison Electric Institute (EEI 1996), Avian Power Line Interaction Committee (APLIC), as appropriate, during design and construction of overhead transmission line power structures and the new substation and 230-kV Substation additions.

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Preferred Alternative A

Short-term direct impacts to biological resources would include loss of individuals during construction or direct disturbance of species during critical periods in their life cycle. Long-term direct impacts could include alteration and/or fragmentation of habitat and electrocutions and collisions. Indirect impacts could include providing access to areas not previously accessible. See *Section 5.3* for a more complete discussion of environmental protection measures.

Birds approach Benton Lake NWR during spring and fall migration. They also frequent habitats located within the five WPA's. However, Preferred Alternative A does not come within 1 mile of a WPA. There is a possibility for collisions with the lines east of Benton Lake NWR.

Impacts on sharp-tailed grouse leks could result from disturbance during the breeding season in April and early May, and to nesting hens during May and early June. However, based on MATL's commitment to curtail construction in any sharp-tailed nesting habitat during the nesting season and to use raptor perch deterrents as appropriate, no impacts to breeding sharp-tailed grouse would occur from construction.

Raptor nest surveys conducted in the area showed no raptor nests occurring within 0.5 miles of Preferred Alternative A. Nesting habitat occurs in cottonwood groves found along the Marias and Teton rivers and in ornamental trees found near residences, generally greater than one mile away from the Preferred Alternative A. Based on MATL's commitment to implement timing restrictions to avoid any discovered raptor nests, no impacts to nesting raptors would likely occur (see *Section 5.3*)**.**

Impacts on big game species are not anticipated. Pronghorn and mule deer does with fawns could be displaced during late spring and early summer, but impacts are not anticipated as construction will take place in late summer/fall.

Disturbance to wildlife from noise, vehicles, and human presence during construction would be localized and of short duration. Bird nests could be destroyed if birds are nesting. However, many of the birds would re-nest if the first attempt were unsuccessful. No long-term impacts associated with operating and maintaining the line would occur to wildlife. MATL would mark those spans that cross communication flyways or other areas where bird collisions are likely.

The structures for Preferred Alternative A would not be sited within any water bodies and construction activities would not occur within water bodies that support fish populations. Construction of Preferred Alternative A would not significantly impact any fish populations or species distribution.

Because impacts associated with construction and operation of the proposed line would be short term or would not likely result in mortality that substantially reduces wildlife populations, direct and indirect impacts on wildlife would not be significant.

Alternative B

Short-term direct impacts to biological resources would include loss of individuals during construction or direct disturbance of species during critical periods in their life cycle. Long-term direct impacts could include alteration and/or fragmentation of habitat and electrocutions and collisions. Indirect impacts could include providing access to areas not previously accessible. See *Section 5.3* for further discussion of environmental protection measures.

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Birds approach Benton Lake NWR during spring and fall migration. They also frequent habitats located within the five WPA's. However, Alternative B does not come within 1 mile of a WPA. There is a possibility for collisions with the lines east of Benton Lake NWR.

Impacts on sharp-tailed grouse leks could result from disturbance during the breeding season in April and early May, and to nesting hens during May and early June. However, based on MATL's commitment to curtail construction in any sharp-tailed nesting habitat and to use raptor perch deterrents as appropriate, no impacts to breeding sharp-tailed grouse would occur from construction.

Raptor nest surveys conducted in the area showed no raptor nests occurring within 0.5 miles of Alternative B. Nesting habitat occurs in cottonwood groves found along the Marias and Teton rivers and in ornamental trees found near residences, generally greater than one mile away from the Alternative B. Based on MATL's commitment to implement timing restrictions to avoid any discovered raptor nests, no impacts to nesting raptors would occur.

Impacts on big game species are not anticipated. Pronghorn and mule deer does with fawns could be displaced during late spring and early summer, but impacts are not anticipated as construction will take place in late summer/fall.

Disturbance to wildlife from noise, vehicles, and human presence during construction would be localized and of short duration. Bird nests could be destroyed if birds are nesting. However, many of the birds would re-nest if the first attempt were unsuccessful. No long-term impacts associated with operating and maintaining the line would occur to wildlife. MATL would mark those spans that cross communication flyways or other areas where bird collisions are likely (see *Section 5.3*).

The structures for Alternative B would not be sited within any water bodies and construction activities would not occur within water bodies that support fish populations. Construction of Alternative B would not significantly impact any fish populations or species distribution.

Because impacts associated with construction and operation of the proposed line would be short term or would not likely result in mortality that substantially reduces wildlife populations, direct and indirect impacts on wildlife would not be significant.

Alternative C

Short-term direct impacts to biological resources would include loss of individuals during construction or direct disturbance of species during critical periods in their life cycle. Long-term direct impacts would include alteration and/or fragmentation of habitat and electrocutions and collisions. Indirect impacts would include providing access to areas not previously accessible.

Birds approach Benton Lake NWR during spring and fall migration. They also frequent habitats located within the five WPA's. Peterson WPA, located in Glacier County northwest of Hay Lake, is within approximately 1.5 miles of Alternative C. There is a possibility for collisions with the lines east of Benton Lake NWR.

Impacts on sharp-tailed grouse leks could result from disturbance during the breeding season in April and early May, and to nesting hens during May and early June. However, based on MATL's commitment to curtail construction in any sharp-tailed nesting habitat and to use raptor perch deterrents as appropriate, no impacts to breeding sharp-tailed grouse would occur from construction.

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Raptor nest surveys conducted in the area showed no raptor nests occurring within 0.5 miles of Alternative C. Nesting habitat occurs in cottonwood groves found along the Marias and Teton rivers and in ornamental trees found near residences, generally greater than one mile away from the Alternative C. Based on MATL's commitment to implement timing restrictions to avoid any discovered raptor nests, no impacts to nesting raptors would occur.

Impacts on big game species are not anticipated. Pronghorn and mule deer does with fawns could be displaced during late spring and early summer, but impacts are not anticipated as construction will take place in late summer/fall.

Disturbance to wildlife from noise, vehicles, and human presence during construction would be localized and of short duration. Bird nests could be destroyed if birds are nesting. However, many of the birds would re-nest if the first attempt were unsuccessful. No long-term impacts associated with operating and maintaining the line would occur to wildlife. MATL would mark those spans that cross communication flyways or other areas where bird collisions are likely.

The structures for Alternative C would not be sited within any water bodies and construction activities would not occur within water bodies that support fish populations. Construction of Alternative C would not significantly impact any fish populations or species distribution.

Because impacts associated with construction and operation of the proposed line would be short term or would not likely result in mortality that substantially reduces wildlife populations, direct and indirect impacts on wildlife would not be significant.

4.5.4 Threatened, Endangered, Proposed, and Sensitive Species

This section addresses the current state of threatened, endangered, proposed, and sensitive species of concern within the Project Study Area (**Figure C-1**) and along the three alternative routes. Information was acquired from the Montana Natural Heritage Program (MNHP), Montana Fish, Wildlife, and Parks (MFWP), the Montana Natural Resource Information System (NRIS), and the U.S. Fish and Wildlife Service (USFWS). Species lists and potential habitat locations were obtained through meetings and correspondence with personnel from the USFWS and MFWP. A request for information on plant and animal species of concern in the vicinity of the Project Study Area was submitted to MNHP in April 2005 and again in August 2005. Both requests yielded the same 15 species of concern reports. Field investigations were conducted in April, May, July, and August 2005 to evaluate biological resources in the vicinity of the proposed alternative transmission line routes. Burrowing owl nesting site surveys were conducted in July 2005 to help assess utilization of the Project Study Area by this species of concern.

Overview

The following discussion describes the species of concern distribution and potential occurrence for species of concern within the Project Study Area. Circular MFSA-2 requires that critical habitat and seasonal habitat for listed species be mapped and discussed in the Overview section [MFSA-2, 3.4.1.d, 3.4.1.e, 3.7.12.b.x, 3.7.12.b.xii]. Critical habitat for listed threatened and endangered species does not occur within the Project Study Area. Circular MFSA-2 requires analysis of habitats of species of concern at the baseline level [MFSA-2, 3.7.12.b.xxii]. To be thorough habitats of species of concern are discussed in the Overview section as well. A list of special status plant and animal species reported to occur within or adjacent to the Project Study Area by the MNHP are listed in **Table 4.5-23.**

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TABLE 4.5-23
SPECIAL STATUS PLANT AND ANIMAL SPECIES REPORTED TO OCCUR WITHIN OR ADJACENT TO THE PROJECT STUDY AREA BY MNHP
MONTANA ALBERTA TIE, LTD.

Common Name	Scientific Name	Status[1]		
		USFWS	BLM	State
PLANTS				
Long Sheath Waterweed	*Elodea longivaginata*	--	Watch	S2
Many-headed sedge	*Carex sychnocephala*	--	--	S1
Chaffweed	*Centunculus minimus*	--	Sensitive	S2
NON-VASCULAR PLANTS				
Entosthodon moss	*Entosthodon rubiginosus*	--	--	SH
American funaria moss	*Funaria americana*	--	--	SH
ANIMALS				
Burrowing Owl	*Athene cunicularia*	--	Sensitive	S2B
Ferruginous Hawk	*Buteo regalis*	--	Sensitive	S2B
Baird's Sparrow	*Ammodramus bairdii*	--	Sensitive	S2B
Black-necked stilt	*Himantopus mexicanus*	--	--	S3 S4B
Black-crowned Night-heron	*Nycticorax nycticorax*	--	--	S3B
Peregrine falcon	*Falco peregrinus*	--	Sensitive	S2B
Common Tern	*Sterna hirundo*	--	--	S3B
White-faced Ibis	*Plegadis chihi*	--	Sensitive	S1B
Franklin's Gull	*Larus pipixcan*	--	Sensitive	S3B
Black-tailed Prairie Dog	*Cynomys ludovicianus*	C	Sensitive	S3
Long-billed Curlew	*Numenius americanus*	--	S	S2B
Bald eagle	*Haliaeetus leucocephalus*	T	--	S3B, S3N

[1] USFWS: PS = Partial status – status in only a portion of the species' range; LE = listed endangered; C = candidate
BLM: Watch = either known to be imperiled and suspected to occur on BLM lands, suspected to be imperiled and documented on BLM lands, or needing further study for other reasons
State: S2 = Imperiled because of rarity, or because of other factors demonstrably making it very vulnerable to extinction throughout its range; B = a state rank modifier indicating breeding status for a migratory species; S3 = vulnerable because of rarity, or found in restricted range even though it may be abundant at some of its locations; S4 = apparently secure, though it may be quite rare in parts of its range, especially at the periphery; S1 = critically imperiled because of extreme rarity, or because of some factor of its biology making it especially vulnerable to extirpation; SH = Historical, known only from records over 50 years ago; may be rediscovered; N = non-breeding.

Long Sheath Waterweed

Adjacent to the Project Study Area, long sheath waterweed was found in a pond on the Blackfeet Indian Reservation in Glacier County in 1989 (MNHP 2005b). A dense population of 1,001 to 10,000 plants was reported. The pond was dammed to raise the water level and is located in an active oil field that is used for livestock grazing. The area was characterized by rolling glacial pothole grasslands dominated by thickspike wheatgrass (*Agropyron dasystachyum), Idaho fescue (Festuca idahoensis)* with Richardson's pondweed (*Potamogeton richardsonii)* and horned pondweed (*Zannichellia palustris).* The habitat of long sheath waterweed is shallow water of ponds and lakes on the plains. A total of 6 occurrences of this species are known in Montana (MNHP 2005c).

Many-headed Sedge

Many-headed sedge is known to occur in Cascade County on the south side of the Missouri River along the southern boundary of the Project Study Area. Six occurrences of this species are known in Montana. The habitat of many-headed sedge is moist soil of meadows along

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streams and ponds in the valleys and on the plains. The combination of long, leaf-like lower bracts, and long, narrow perigynia make this species of concern distinctive. The fruit matures from July to August.

Chaffweed

Chaffweed is known to occur in the same area as many-headed sedge – on the south side of the Missouri River along the southern boundary of the Project Study Area. This species of concern is known to occur in 13 areas in Montana. The habitat of chaffweed is vernally wet, sparsely vegetated soil around ponds and along rivers and streams in the valleys and on the plains. Flowering and fruiting takes places from June through September.

Entosthodon Moss

Approximately 0.5 miles south of the 230-kV Substation along the Missouri River is a known population of Entosthodon moss. Entosthodon moss is restricted to seasonally damp and alkaline, usually silt or clay-rich soil at the edges of ponds, lakes, and sloughs, and on seepage slopes in relatively dry environments. This species is endemic to western North America where it occurs in southern British Columbia, and has been reported from Montana, Arizona, and New Mexico.

American Funaria Moss

One record dating back to 1902 indicates the presence of American funaria moss along the Missouri River, approximately 0.5 miles south of the 230-kV Substation. Little is published about this species of concern. It is thought that the preferred habitat of this species is limestone caves and cliffs.

Ferruginous Hawk

A breeding population of approximately 20 pairs of ferruginous hawks was located in 1994 in the Kevin Rim and Buckley Coulee area in the northeastern and north-central portions of the Project Study Area. MNHP and MFWP biologists indicate this species continues to breed along Kevin Rim (Olson 2005). This area is a mix of privately owned land and state trust land in Toole County. Kevin Rim is further described in *Section 4.5.1*. Kevin Rim is a sandstone escarpment that runs approximately 8 miles, generally north-south, and faces east. The cliffs and adjacent badlands, grasslands, and draws host a very high density of raptor nests, primarily ferruginous hawks and prairie falcon. *Section 4.5.3* discusses additional raptors that nest in the Kevin Rim area. Two biologists walked along approximately three miles of Kevin Rim in early May 2005 surveying for raptor nests. No nests and no raptors were observed at that time.

Ferruginous hawks also occur in and around Benton Lake NWR in Cascade, Chouteau, and Teton counties. The area is a mix of federally managed land (Benton Lake NWR), privately owned land, and state trust land. A breeding population of at least 2 pairs has been recorded within the Refuge. The full extent of occupied breeding habitat is unknown. The habitat of ferruginous hawks in Montana has been studied extensively and described as mixed-grass prairie, shrub-grasslands, grasslands, grass-sagebrush complex, and sagebrush steppe (MNHP 2004c).

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Peregrine Falcon

An historical peregrine eyrie is known to occur on private land near the confluence of Cut Bank Creek and Two Medicine River where the Marias River forms in Glacier County. Eyries have a high potential for re-occupancy. It is unknown when peregrine falcons last occupied or were sighted around this eyrie. Peregrine falcons arrive in northern breeding areas in late April-early May and departure begins in late August-early September. Nests typically are situated on ledges of vertical cliffs, often with a sheltering overhang. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey. Substitute man-made sites can include tall buildings, bridges, rock quarries, and raised platforms (MNHP 2004c).

Two biologists walked along approximately three miles of Kevin Rim in early May 2005 surveying for raptor nests. No nests and no raptors were observed at that time.

Black-tailed Prairie Dog

A black-tailed prairie dog town is located southeast of Shelby in Toole County north of the Marias River. This particular population is at the western extent of this species' known distribution (Olson 2005). Prairie dog colonies are found on flat, open grasslands and shrub/grasslands with low, relatively sparse vegetation. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama, and big sagebrush. Colonies are associated with silty clay loams, sandy clay loams, and loams. Fine to medium textured soils are preferred, presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils.
Shallow slopes of less than 10 percent are preferred, probably in part because such areas drain well and are only slightly prone to flooding. By colonizing areas with low vegetative stature, prairie dogs often select areas with past human (as well as animal) disturbance. In Montana, colonies tend to be associated with areas heavily used by cattle, such as near water tanks and long-term supplemental feeding sites (MNHP 2004c).

Baird's Sparrow

Baird's sparrow nests and individual birds have been reported in Teton County on private land. The most recent data available are from the early 1990's. One nest contained 4 eggs and the second nest contained 6 eggs. This species is more common east of the Continental Divide in Montana. The majority of observations of the species in the state occur at the earliest in May and the latest in July (MNHP 2004c). Baird's sparrows prefer to nest in native prairie, but structure may be more important than plant species composition. Nesting may take place in cultivated grasses (nesting has been observed in crested wheat, while smooth brome is avoided). This sparrow has also been found to use drier areas during unusually wet years, and wet areas during unusually dry years. Because a relatively complex structure is so important for nesting, areas with little to no grazing activity are required (MNHP 2004c).

Burrowing Owl

Burrowing owl nesting sites are known to occur on Benton Lake NWR in Cascade and Chouteau counties. Fledglings have been observed on at least two nest sites on the Refuge. Burrowing owls are migratory in the northern portion of their range, which includes Montana. The extreme dates of observation for burrowing owls in Montana are, at the earliest, March and, the latest, October (MNHP 2005d). The majority of the spring reports for this species occur, however, in April with most fall observations in September (MNHP 2004c).

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Burrowing owls are found in open grasslands, where abandoned burrows dug by mammals such as ground squirrels (*Spermophilus* spp.), prairie dogs (*Cynomies* spp.) and badgers (*Taxidea taxus*) are available. Black-tailed prairie dog (*Cynomys ludoviscianus*) and Richardson's ground squirrel (*Spermophilus richardsonii*) colonies provide the primary and secondary habitat for burrowing owls in the state. The burrows may be enlarged or modified, making them more suitable. Burrowing owls spend much time on the ground or on low perches such as fence posts or dirt mounds (MNHP 2004c).

Black-necked Stilt

Approximately 25 black-necked stilt nests were found in 1988 on Benton Lake NWR in Cascade, Chouteau, and Teton counties. This species continues to migrate to and nest on the Refuge (Johnson 2005). Extreme migration dates in Montana are April, reported at Benton Lake NWR, and September, reported at Helena Valley Regulating Reservoir. In Montana, black-necked stilts nest in medium to large wetland complexes of open marshes and meadows, often in alkali areas.

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Black-crowned Night-Heron

The first confirmed nesting of this species was in 1979, although records indicate presence of the birds as early as 1967 in the Benton Lake NWR area. The earliest records for Montana indicate arrival in April, with sightings throughout the summer months and extending into September, when most of the individuals begin their southerly movement. In 2000, one individual was found in the Chester area and stayed until October. Although highly adaptable to a variety of habitats, the black-crowed night-heron is likely to use shallow bulrush (*Scirpus* spp.) or cattail (*Typha* spp.) marshes, most often within a grassland landscape. In addition, they will also nest in cottonwoods, willows, or other wetland vegetation that allow them to nest over water or on islands that may afford them protection from mammalian predators. Most colonies are located in large wetland complexes, typically with a one-to-one ratio of open water and emergent vegetation (MNHP 2004c).

Common Tern

Approximately 75 common tern nests were found on Benton Lake NWR in 1988 and this species continues to nest on the Refuge (Johnson 2005). The earliest migration date for common tern in Montana is in April, but the most concentrated arrival of birds occurs in May. Breeding has been recorded in May, June, and July, with fall departure beginning in late August and continuing into September. Nesting in Montana generally occurs on sparsely vegetated islands in large bodies of water. Nest substrate at these locations includes sparsely sandy, pebbly, or stony substrate, surrounded by matted or sparsely scattered vegetation (MNHP 2004c).

White-faced Ibis

Approximately 15 white-faced ibis nests were found in 1988 on Benton Lake NWR. The number and location of this species' nests on the Refuge varies greatly from year to year. It is reported that the white-faced ibis often nests with the black-crowned night heron. White-faced ibises usually leave their wintering grounds in late March to early April. The earliest white-faced ibis observation in Montana was at Lee Metcalf National Wildlife Refuge in March, but the most concentrated arrival in Montana occurs in May. In late summer, white-faced ibises will disperse throughout the state before beginning the fall migration to their wintering habitat. In Montana,

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most begin their southern movement in August and by September they are usually gone from the state (MNHP 2004c).

The white-faced ibis breeding habitat is typically freshwater wetlands, including ponds, swamps and marshes with pockets of emergent vegetation. They also use flooded hay meadows and agricultural fields as feeding locations. Ibises nest in areas where water surrounds emergent vegetation, bushes, shrubs, or low trees. In Montana, white-faced ibises usually use old stems in cattails, hardstem bulrush, or alkali bulrush over shallow water as their nesting habitat (DuBois 1989). Water conditions usually determine whether nesting occurs in a particular area. Therefore, white-faced Ibis nesting sites can often move around from year to year. However, they are a fairly adaptable species and the primary breeding requirement is colony and roosting site isolation (MNHP 2004c).

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Franklin's Gull

In 1994, approximately 13,000 Franklin's gull nests were estimated to have occurred on Benton Lake NWR. The Franklin's gull generally returns to the state in mid-April and is gone by early to mid-October. Preferring large, relatively permanent prairie marsh complexes, the Franklin's gull builds its nests over water on a supporting structure of emergent vegetation. Nesting is noted to occur in cattails and bulrushes. Typical water depth is 30 to 60 cm. Nesting over water differs from the nesting habits of Montana's other, generally ground nesting, gulls. Franklin's gulls prefer to nest at sites with intermediate vegetation density, interspersed with open water of various sizes. Preferred nesting sites within a wetland can change from year to year because of changes in water level and associated changes in vegetation. One key feature of selected nesting sites is that the water levels remain high enough throughout the nesting period, or at least until the young can fledge, in order to provide protection from predators. During migration, the Franklin's Gull can be found feeding on dry land, especially in cultivated fields prior to planting (MNHP 2004c).

Long-Billed Curlew

The long-billed curlew (*Numenius americanus*) is ranked as S2B by the state and thus is considered at risk because of very limited and/or declining numbers, range, and/or habitat. The MNHP did not have any element occurrence records for this species within the Project Study Area; however, long-billed curlews were observed within the Project Study Area. The long-billed curlew is a migratory summer resident that breeds and nests in Montana. The species inhabits short-grass prairie communities, with grassland structure being more important than species composition, and appears to require large blocks of grasslands with diverse foraging habitats. The long-billed curlew nests in well-drained native grasslands, sagebrush, and agricultural lands with a gently rolling topography. While wet habitats are not necessary for nesting, proximity to water has been shown to influence nest success. Curlews forage on terrestrial insects, particularly beetles and grasshoppers, but may also occasionally eat toads, spiders, and berries. The species migrates from coastal habitats in California, Texas, and Mexico, to Montana where they are typically present between May and August.

Bald Eagle

Seasonal habitat for the federally listed threatened bald eagle does exist within the Project Study Area. The cottonwood gallery forest along the Marias and Teton rivers may be used by bald eagles during the winter, however they are not known to nest in the Project Study Area (Olson 2005b). The majority of birds nesting in Montana are found in the western third of the state; although breeding pairs may be found along many of the major rivers and lakes in the

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central portion of the state and along the Yellowstone and Missouri Rivers to the eastern prairie lands (MNHP 2004c). East of the Continental Divide, the presence of bald eagles may be somewhat more seasonally dependent than in the western part of the state. Migrants from northern climates travel through Montana to reach wintering grounds further south.

Fish

The MNHP species of concern occurrence report did not include any fish species of concern. However, a search of the Montana Fish Information System (MFIS) indicated that three special status fish species potentially occur in the Teton River within the Project Study Area. These three species are sauger (*Stizostedion canadense*), blue sucker (*Cycleptus elongates*), and sturgeon chub (*Macrohybopsis gelida*).

The sauger is considered at risk by the State because of very limited and/or declining numbers, range, and/or habitat (S2). The current distribution of the sauger in Montana includes the main stem of the Missouri River and portions of several tributaries including the Teton River near where the transmission line would span. The sauger is physiologically adapted for turbid environments and the species typically inhabits large turbid rivers and shallow lakes. Saugers spawn in large tributaries, and juveniles rear in off-channel habitats during spring and summer before shifting to main channel habitats in autumn.

The blue sucker is considered at risk/potentially at risk (S2S3) by the State. Eastern Montana is the home of the blue sucker and appears to inhabit the larger streams, primarily the Missouri and Yellowstone rivers. However, blue suckers make long spawning movements from the lower Missouri River to upstream areas and tributary streams followed by dispersal downstream. Blue suckers prefer waters with low turbidity and swift current (MNHP 2004c). The Montana Fisheries Information System indicates that the blue sucker can be found in the Teton River within the Project Study Area; however, this would be the western extent of this species' distribution within Montana.

The sturgeon chub is considered at risk (S2) by the State. The sturgeon chub is one of several native minnows found in the eastern drainage. Sturgeon chubs are rarely seen or collected so little is known about them. Their food habits are unknown, but the ventral mouth and short intestine indicate they feed on bottom-dwelling insects. Sturgeon chub are found in turbid water with moderate to strong current over bottoms ranging from rocks and gravel to coarse sand (MNHP 2004c).

Baseline

The following discussion describes the distribution of habitats of species of concern along the three alternative routes. In accordance with *Circular MFSA-2* the following specific information will be addressed in the Baseline section:

- Migratory birds
- Habitats of species of concern [MFSA-2, 3.7.12.b.xxiii]
- Raptor nests [MFSA-2, 3.7.12.b.xxiv]

A set of 1:24,000 scale overlays has been created for the Baseline section titled *BioResources* ***(*****Figure E-1c** through **Figure E-14c*****).*** This set of overlays contains the following data:

- PLSS Grid
- Field Surveyed Sharptail grouse leks

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- Agricultural Experiment Station
- Bird Points
- Class I/II Streams
- Federal/State Managed Lands
- Species of Concern
- Mule Deer Winter Range
- Prime Waterfowl Habitat
- Mature Riparian Forest

Field investigations were conducted in May, July, and August 2005 to evaluate habitat of species of concern in the vicinity of the proposed alternative transmission line routes. Information on vegetative communities, wetlands, wildlife habitats, and actual/potential species occurrence was obtained through these field investigations. The potential for occurrence of plant, wildlife, and fish species not observed during field investigations was assessed based upon evaluation of species distribution and habitat use, and information from previous research studies and biological reports. In particular, local wildlife biologists with the MFWP provided valuable information and mapping of sensitive species and important habitats within the Project Study Area. The MNHP furnished data on the occurrence of special status plant and wildlife species.

Burrowing owl nesting site surveys were conducted in July 2005 to help assess utilization of the Project Study Area by the species. With the guidance of a MFWP biologist (Olson 2005) surveys were focused north of the Marias River, north of Highway 2, and along the Kevin Rim. Point-count surveys were used to survey for burrowing owls in July 2005 (Conway and Simon 2003). Point-count survey routes were pre-selected based on habitat and anecdotal observation information by landowners, and the MFWP biologist. At each survey point, the observer pulled the vehicle off the road, parked on the shoulder, exited the vehicle, and performed a 6-minute point-count survey listening for burrowing owl calls and scanning the surrounding landscape for owls using binoculars.

Preferred Alternative A

The route of Preferred Alternative A traverses through the known habitat range of 5 species of concern in Montana. **Table 4.5-24** lists the linear miles of special status species' habitat range along each of the three alternatives, as well as a direct comparison between the two northern border alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative).

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Burrowing owl

Preferred Alternative A would pass through and adjacent to burrowing owl habitat along the east side of Benton Lake NWR. While biologists did not observe any burrowing owls during field investigations, MFWP biologists and landowners have reported seeing this species within 1 mile of Preferred Alternative A north of the Marias River.

Black-necked stilt and Black-crowned night heron

Preferred Alternative A passes through the eastern edge of potential nesting grounds for the black-necked stilt and black-crowned night heron just outside the eastern boundary of Benton Lake NWR. This area is a potential migration corridor on the east side of Benton Lake NWR.

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Ferruginous Hawk

Preferred Alternative A crosses through two areas of known Ferruginous Hawk range; one area is along the northern most section of the Preferred Route north of Cut Bank, and the other is located near the Benton Lake National Wildlife Refuge.

Peregrine Falcon

Preferred Alternative A crosses through the location of occurrence of a peregrine falcon eyrie along the Marias River. In May, July, and August 2005 biologists surveyed the confluence of Cut Bank Creek and Two Medicine River looking for the eyrie and signs of peregrine falcons. Neither the eyrie nor peregrine falcons were observed. It is unknown when peregrine falcons last occupied or were sighted around this eyrie (Olson 2005b).

Long Sheath Waterweed

Long sheath waterweed was not found during field investigations of prairie potholes in the vicinity of Preferred Alternative A in July and August 2005.

Non-Vascular Plants

Entosthodon moss is known to occur 0.5 miles south of the 230-kV Substation. Preferred Alternative A would not traverse through this moss' habitat. American funaria moss historically occurred in the same area as Entosthodon moss, but the last recorded observation was in 1902.

Long-billed curlew

Long-billed curlews were observed in wheat-stubble fields and CRP land during field investigations throughout the summer 2005. The best potential habitat is located along the central portion of Preferred Alternative A.

TABLE 4.5-24
LINEAR MILES OF SPECIAL STATUS SPECIES' HABITAT RANGE ALONG EACH ALTERNATIVE
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Common Name	State Rank	Alternative			Segments	
		Preferred A	B	C	Western	Eastern
Burrowing owl	S2B	4.18	3.92	.068	--	--
Black-crowned Night-heron	S3B	11.16	9.12	6.49	--	--
Ferruginous Hawk	S2B	6.46	0.0	0.0	--	0.77
Peregrine falcon	S2B	2.51	2.20	2.36	--	--
Black-necked stilt	S3, S4B	11.17	9.13	6.49	--	--
All species (minus overlaps)	--	20.04	11.34	8.86	0.0	0.77

Alternative B

The route of Alternative B traverses through the known habitat range of 4 species of concern through which Preferred Alternative A passes (**Table 4.5-24**).

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Burrowing owl

Alternative B would pass through and adjacent to burrowing owl habitat along the east side of Benton Lake NWR. While biologists did not observe any burrowing owls during field investigations, MFWP biologists and landowners have reported seeing this species within one mile of Alternative B north of the Marias River.

Black-necked stilt and Black-crowned night heron

Alternative B passes through the eastern edge of potential nesting grounds for the black-necked stilt and black-crowned night heron just outside the eastern boundary of Benton Lake NWR. This area is a potential migration corridor on the east side of Benton Lake NWR.

Peregrine Falcon

Alternative B crosses through the location of occurrence of a peregrine falcon eyrie along the Marias River. In May, July, and August 2005 biologists surveyed the confluence of Cut Bank Creek and Two Medicine River looking for the eyrie and signs of peregrine falcons. Neither the eyrie nor peregrine falcons were observed. It is unknown when peregrine falcons last occupied or were sighted around this eyrie (Olson 2005b).

Long Sheath Waterweed

Long sheath waterweed was not found during field investigations of prairie potholes in the vicinity of Alternative B in July and August 2005.

Non-Vascular Plants

Entosthodon moss is known to occur 0.5 miles south of the 230-kV Substation. Alternative B would not traverse through this moss' habitat. American funaria moss historically occurred in the same area as Entosthodon moss, but the last recorded observation was in 1902.

Long-billed curlew

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Long-billed curlews were observed in wheat-stubble fields and CRP land during field investigations throughout the summer 2005. The best potential habitat is located along the central portion of Alternative B.

Alternative C

Alternative C extends through the location of occurrence of four species of concern (**Table 4.5-24**).

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Burrowing owl

This route passes through a very small area of known burrowing owl nesting habitat. While biologists did not observe any burrowing owls during field investigations along this alternative, MFWP biologists and landowners have reported seeing this species within one mile of Alternative C north of the Marias River.

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Black-necked stilt and Black-crowned night heron

Alternative C passes through the eastern edge of potential nesting grounds for the black-necked stilt and black-crowned night heron just outside the eastern boundary of Benton Lake NWR. This area is a potential migration corridor on the east side of Benton Lake NWR.

Peregrine Falcon

Alternative C crosses through the location of occurrence of a peregrine falcon eyrie along the Marias River. In May, July, and August 2005 biologists surveyed the confluence of Cut Bank Creek and Two Medicine River looking for the eyrie and signs of peregrine falcons. Neither the eyrie nor peregrine falcons were observed. It is unknown when peregrine falcons last occupied or were sighted around this eyrie (Olson 2005b).

Long Sheath Waterweed

Long sheath waterweed was not found during field investigations of prairie potholes in the vicinity of Alternative C in July and August 2005.

Non-Vascular Plants

Entosthodon moss is known to occur 0.5 miles south of the 230-kV Substation. Alternative C would not traverse through this moss' habitat. American funaria moss historically occurred in the same area as Entosthodon moss, but the last recorded observation was in 1902.

Long-billed curlew

Long-billed curlews were observed in wheat-stubble fields and CRP land during field investigations throughout the summer 2005. The best potential habitat is located along the central portion of Alternative C.

Western/Eastern Alternative Segment Comparison

The 18.5 mile Western Alternative Segment does not cross any special status species' habitat range. The 18.41 mile Eastern Alternative Segment (part of the Preferred Alternative A) crosses .77 miles of Ferruginous Hawk habitat range.

Environmental Consequences

Potential adverse impacts to special status species can be separated into impacts associated with project construction and those related to operations and maintenance of the proposed transmission line. The primary potential adverse impacts include direct mortality, habitat loss and fragmentation, disturbance and displacement of individual animals, interference with behavioral activities, and disturbance associated with increased public access. These potential impacts are listed and discussed in *Section 4.5.3* in **Table 4.5-22**. Effects associated with increased potential for exposure to contaminants, generation of fugitive dust, and fire risks are discussed in *Section 4.5.1.*

Community types crossed by the three alternative routes provide potential habitat for the burrowing owl, peregrine falcon, and long-billed curlew. It is unlikely that the black-crowned

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night heron or black-necked stilt would nest in the area east of the Refuge through which the alternatives traverse, as it is more than 1 mile from a wetland.

Preferred Alternative A and Alternative B both traverse through similar types of habitat ranges for most species of concern (**Table 4.5-24**), although Alternative A also passes through approximately 6.5 miles of Ferruginous Hawk habitat range. Alternative C passes through similar types, though slightly less mileage, of habitat as compared to Alternative A and B. In particular, Alternative C passes through less than a mile of burrowing owl habitat. Differences in impacts to sensitive species among the three alternatives are minimal therefore potential impacts are discussed in aggregate. Preferred Alternative A has a total length of approximately 129.89 miles. Low impacts to species of concern are projected to occur along approximately 20 miles of Preferred Alternative A; 11.34 miles of Alternative B; and 8.86 miles of Alternative C.

Potential impacts to wildlife species of concern for each alternative transmission line route were assessed through an evaluation of existing conditions and potential project-related effects. These effects could include temporary disturbance during construction and maintenance activities, habitat loss and fragmentation effects associated with clearing and grading of structure sites and access roads, the creation of new public access into undisturbed habitats, and the potential for increased predation by raptors. Effects related to generation of dust, exposure to contaminants, invasive weeds, and increased risk of fire are considered of lesser significance to wildlife, and are discussed in the Vegetation section. Sensitive or important wildlife habitat within the Project Study Area include 1) intact native prairie grasslands that provides habitat for sharp-tailed grouse, long-billed curlew, and other grassland bird species, 2) mule deer winter range, 3) sharp-tailed grouse leks, and 4) mature riparian cottonwood forests that represent a unique habitat type and potential bald eagle winter habitat.

Potential impacts were largely determined based upon the habitat type crossed, and the known (i.e., mule deer winter range) or potential (i.e., sage-grouse leks) sensitive wildlife resources within that habitat type. Generally, segments of transmission line routes that contain native grasslands, mule deer winter range, riparian cottonwood forests, or are within 4 miles of a known lek were initially classified as potential impact because of the potential for disturbance, habitat loss, increased public access, and grouse predation. Initial impact reduced due to the implementation of environmental protection/mitigation measures (see **Table 5.3-1**). These conditions included the presence of an existing transmission line or roadway, the use of existing roadways for construction and maintenance (rather than constructing a new road through undisturbed habitat), and areas where native habitats have been fragmented by residential and agricultural activities (rather than a large expanse of intact habitat). Portions of transmission lines that cross cultivated agricultural lands were assigned initial impact values of either no identifiable impact (if no grouse leks/habitat occurred in the vicinity) or low impact (if grouse leks/habitat does occur in the vicinity).

Residual impacts were determined by applying one or more mitigation measures to reduce the potential adverse effects associated with the transmission line and substations. For example, new roads constructed in mule deer winter range would be gated to prevent general public access and minimize the potential for disturbance impacts during winter months. The environmental protection mitigation measures that relate specifically to wildlife are identified in **Table 5-2**. Through the implementation of these measures, residual impacts were generally reduced to moderate, low, or no identifiable impact.

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4.6 Social Resources

MATL's assessment of potential impact to social resources in the Project Study Area resulting from implementation of the proposed Project includes those aspects of the human environment that MDEQ has identified in Circular MFSA-2 as requiring evaluation. At the Overview and/or Baseline level, these include factors related to economic and land use activities, human health and safety, aesthetics of the human environment, and history of the human environment.

4.6.1 <u>Socioeconomics</u>

The Project Study Area lies within portions of the following six counties: Cascade, Teton, Chouteau, Pondera, Toole, and Glacier (**Figure C-1**). The following provides an overview of socioeconomic conditions in the Project Study Area as required of *Circular MFSA-2*, 3.4.7.a-h, and is broken down by county to include demographics, social characteristics, economic activity (including employment, labor force, and earnings), school budgets, and public services (including police, fire, health and emergency services).

As described in the *Land Use* section, the primary use of land within the Project Study Area is for agriculture, with approximately 88 percent of land in this classification (see **Table 4.6-3**). The relationship between agricultural land use and economic activity within each county is also evidenced by review of data summarized in the Economic Activity discussions for each county, specifically in each **Industry** table provided in this *Socioeconomic* section. Within the Project Study Area, the agriculture, forestry, fishing and hunting, and mining sector consistently ranks as one of the counties' top 3 industry sectors by percent. The exception being Cascade County, which contains a more level distribution of industry sectors by percent, largely due to the influence of the City of Great Falls, and it's large base for goods and services relative to towns in the other, more rural counties in the Project Study Area.

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4.6.1a Cascade County

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Cascade County lies in the southern portion of the Project Study Area and is Montana's third most populous with 79,298 residents, according to the 2001 estimates produced by the U.S. Census Bureau. Cascade County includes 2,697.9 sq. miles in land area and a population density of 29.6 individuals per square mile. County population levels have declined by 1.8% in the past 30 years.

Communities within Cascade County include: Cascade, Belt, Monarch, Ulm, Vaughn and the county seat Great Falls. Cascade County is also the home of Malmstrom Air Force Base in Great Falls. Thirteen public school districts are located within the county as well as two colleges, Montana State University – Great Falls and The University of Great Falls.

Demographics

Average family size within Cascade County is 2.97 individuals and the average household size is 2.41 individuals. Most individuals are homeowners (64.9) while the remainder rent housing. Less than eight percent of housing units are unoccupied. General demographic data for Cascade County including gender, age, and ethnicity profiles are presented in the insert below.

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Gender	Number	Percent of Population within Cascade County	Percent of Population within Montana
Male	39,756	49.5	49.8
Female	40,601	50.5	50.2
Age			
15 or younger	17,163	21.4	20.6
16-24	11,100	13.8	14.4
25-44	22,558	28.1	27.2
45-64	18,288	22.8	24.4
65+	11,248	14.0	13.4
Average Age (years)		37.20	37.38

Source: U.S. Census Bureau 2000 Census: ePodunk

Population estimates of incorporated places within Cascade County (as of July 1, 2004) include the following: Cascade (799), Belt (617), and the county seat Great Falls (56,503).

The majority of the population within Cascade County is identified as "white". The percentage of race and ethnicity within the county is presented below by major ethnic groups.

Race or Ethnicity	Number	Percent of Population within Cascade County	Percent of Population within Montana
White	72,897	90.7	90.6
Black or African American	900	1.1	0.3
American Indian and Alaskan Native	3,394	4.2	6.2
Asian	652	0.8	0.5
Native Hawaiian and other Pacific Islander	67	0.1	0.1
Some other race	547	0.7	0.6
Two or more races	1,900	2.4	1.7
Hispanic or latino	1,949	2.4	2.0

Source: U.S. Census Bureau 2000 Census: ePodunk

Housing Stock

Below is a summary of Cascade County's trends for housing stock from 1990-2000.

Cascade County – Housing Stock			
Unit Type	**1990 (%)**	**2000 (%)**	**Trend**
Total Units	33,063 (100)	35,225 (100)	6.5% +
Owner Occupied	19,187 (58)	21,134 (60)	10.0% +
Renter Occupied	10,946 (33)	11,413 (32)	4.2% +
Vacant	2,930 (9)	2,678 (8)	8.6% -
Seasonal	765	443	42.0% -

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Social Characteristics

The social character of Cascade County is varied and ranges from urban/suburban to rural depending on geography. In general, the social characteristics are consistent with those of rural and semi-rural Montana, including appreciation of the outdoors. Great Falls, Montana's second largest city, provides the core economic and entertainment base for the county in the form of goods and services, amenities, and county government. Additionally, Malmstrom Air Force Base provides a unique demographic to the county relative to the rest of the Project Study Area in that it houses several thousand military personnel and their families, adding to the diversity in the social makeup of the area. Social activities of note include the annual Montana State Fair, PRCA Rodeo Circuit Finals, C.M. Russell Art Show, and others.

Economic Activity

Health care and social assistance is the largest economic sector of 20 major sectors within Cascade County. The average wage per job in this sector is $30,474. Per capita income grew by 13.3% between 1993 and 2003 (adjusted for inflation). Median household income in 2002 was $33,456 (U.S. Census Bureau 2005).

Major industries within Cascade County include those listed below. In addition to these industries, 4.9 percent (3,005 individuals) of the population of Cascade County is employed in the Armed Forces. Approximately 35 percent of the population is not within the labor force.

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INDUSTRY	Number of Individuals	Percent of Industry within County
Agriculture, forestry, fishing and hunting, and mining	1,028	3.0
Construction	2,650	7.6
Manufacturing	1,212	3.5
Wholesale trade	1,289	3.7
Retail trade	4,925	14.2
Transportation and warehousing, and utilities	1,954	5.6
Information	832	2.4
Finance, insurance, real estate, and rental and leasing	2,579	7.4
Professional, scientific, management, administrative, and waste management services	2,259	6.5
Educational, health and social services	8,297	23.8
Arts, entertainment, recreation, accommodation and food services	3,454	9.9
Other services (except public administration)	1,894	5.4
Public administration	2,419	7.0

Source: http://factfinder.census.gov

Countywide information was available for current (2004) earnings by economic sector, as well as for several previous years (back to 2001). Given the availability of this more recent information, 2001-2004 data were utilized to identify trends instead of 1990-2000 data. In general, the data for each county show a positive increase in total wages across most sectors. There was one exceptions noted. Cascade County experienced a marked decrease in total wages within the Natural Resources and Mining sector (agriculture, forestry, mining etc.) between 2001 and 2004, with the largest decline occurring between 2001 and 2002.

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Cascade County - Earnings By Sector and Recent Trends in Earnings

INDUSTRY	Total 2004 Wages by Sector (in thousands)	Trend between 2001-2004 (percent change)
Agriculture, forestry, fishing and hunting, and mining	2815	-49.55%
Construction	63118	+21%
Manufacturing	32166	+.3%
Wholesale trade	51191	+18%
Retail trade	103637	+6.7%
Transportation and warehousing, and utilities	34264	+4.1%
Information	23985	+23.7%
Finance, insurance, real estate, and rental and leasing	89744	+19.4%
Professional, scientific, management, administrative, and waste management services	74368	+17.5%
Educational, health and social services	224140	+16.7%
Arts, entertainment, recreation, accommodation and food services	50432	+16.8%
Other services (except public administration)	23672	+14.5%
Public administration	67345	+21%

Source - US Department of Labor Bureau of Statistics (www.bls.gov)

Countywide information was available for employment and unemployment rates for each county. Data were compiled for the last five years documenting the total labor force available, total employment, total unemployment, and the resulting unemployment rate Unemployment has decreased slightly between 2000 and 2005. The unemployment rate averaged 5.0 percent in 2000 and 4.4 in 2005.

Employment Data and Trends by County 2000-2005(a)

Year	Labor Force	Employment	Unemployment	Unemployment Rate (%)
Cascade County				
2000	38,287	36,386	1,901	5.0
2001	38,419	36,719	1,700	4.4
2002	38,411	36,776	1,635	4.3
2003	38,558	36,992	1,636	4.2
2004	39,209	37,566	1,643	4.2
2005(b)	40,474	38,697	1,777	4.4

a – Reflects 2000 Census-based geography, new model controls, 2000 Census inputs.
b - Average through Nov. 2005
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2005. www.bls.gov

Below is a summary of county revenues and expenditures for the fiscal year ending June 2005. Property tax revenues made up over 48 percent of all county revenues in fiscal year 2004-2005. Public safety was the largest segment draw on the county budget. For fiscal year 2004-2005,

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Cascade County appropriated $2,356,823 to its road fund, $39,451 to its rural fire fund, $165,088 to its emergency medical fund, and $6,811,144 to the public safety fund.

CASCADE COUNTY REVENUES AND EXPENDITURES		
REVENUES	**Cascade County - 2005**	**Percentages**
Program Revenues		
Charges for Services	8,455,985.00	27.9%
Operating Grants and Contributions	5,057,000.00	16.7%
Capital Grants & Contributions	350,930	1.2%
Subtotal - Program Revenues	*13,863,915*	*45.8%*
CASCADE COUNTY REVENUES AND EXPENDITURES		
General Revenues		
Property tax	**14,697,398**	**48.5%**
Other	1,733,813	5.7%
Subtotal - General Revenues	*16,431,211*	*54.2%*
TOTAL REVENUES	**30,295,126**	**100.0%**
EXPENSES (by function)		
General Government	6,692,050	21.1%
Public Safety	**9,257,363**	**29.3%**
Public Works	3,893,224	12.3%
Public Health	4,018,923	12.7%
Social & Economic Services	1,813,239	5.7%
Culture and Recreation	455,192	1.4%
Housing & Community Development	146,645	0.5%
Conservation of Natural Resources	39,300	0.1%
Miscellaneous	330,154	1.0%
Debt Service Costs & Fees		0.0%
Debt Service Interest	692,947	2.2%
Montana Expo Park	3,727,867	11.8%
Solid Waste	535,224	1.7%
Water Operating	41,318	0.1%
TOTAL EXPENSES	**31,643,446**	**100.0%**

School Budget

Below is a summary of the 2005 adopted general fund budget for the Cascade County school district. The general fund budget does not include funds for transportation or retirement.

County	**2005 Adopted General Fund Budget**	**Percent of General Fund from County Property Taxes**
Cascade	64,022,577	31.1%

Source: Office of Public Instruction (OPI), Helena, Montana

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Public Services

Police Services - The Cascade County Sheriff's Office covers all areas within the County, with the exception of Great Falls. The Sheriff's office has a force of 34 officers. The City of Great Falls is covered via the City Police Department, with 82 officers and 65 patrol and support vehicles available to handle crime and provide educational services. Given the size of the Cascade County and City of Great Falls force in comparison to other counties in the Project Area, this project should not cause an impact on department operations, or a significant increase in the department's workload.

Fire Services - The Great Falls Fire Rescue consists of 65 uniformed Firefighters, in addition to the Fire Chief, Assistant Chief and several other staff. All suppression Firefighters are certified EMT's with 19 of them also certified as Paramedics. There are four stations in total. The stations combined have 6 1250 gallon per minute fire engines, water tender, snorkel, rescue vehicle, Haz-Mat van and boat. No impacts are anticipated given the roster size and level of fire service currently available. Other fire services in Cascade County include:

- Sun River Fire Service Area
- Vaughn Volunteer Fire Department
- Black Eagle Volunteer Fire Department- one station
- Malmstrom AFB Fire Department
- Gore Hill Volunteer Fire Department – one station
- Cascade Volunteer Fire Department – one station

Health Services - Benefis Healthcare is the largest hospital in the state, providing care to approximately 225,000 people in a service area covering 44,814 square miles – 15 counties in Northcentral Montana. Benefis Healthcare provides a full range of medical services, and is the largest hospital in Montana. Currently it operates 502 beds at its two campuses. No project related impacts are foreseen at this large facility. Benefis also operates the Williams-Ario Regional Emergency and Trauma Center (discussed in more detail below under Emergency Medical Services).

In addition to the emergency rooms and ambulance services identified above, regional emergency services are available through Williams-Ario Regional Emergency and Trauma Center, located in Great Falls. This center is one of the largest and busiest Emergency Departments (ED) in Montana. They provide 19 emergency exam rooms and an additional 7 non-urgent care rooms for its "fast track" program. The ED treated more than 34,800 patients in 2005, and is staffed with 9 Board-certified or -eligible physicians, with double coverage 16 hours per day. The Fast track program has 4 family nurse practitioners who treat non-urgent patients.

As a Level II Trauma Center, Benefis Healthcare's Emergency Department treats critical trauma victims injured across central Montana, and serves all six counties in the Project Area. Flight services (Mercy Flight) provide aeromedical transport via both helicopter and airplane to meet these needs. Mercy Flight has a KingAir 100 twin-engine turboprop with a 800-mile flight radius, and a Eurocopter A-Star-B2 with a 200-mile flight radius. The Mercy Flight helicopter program flies patients for fast transport from area hospitals to specialty care in Great Falls. Mercy Flight crews also respond on-site to bring patients from isolated areas or accident scenes to the Regional Emergency Center. No impacts to services are expected at this facility due to the proposed project *(personal communication, Cindy Peterson, Emergency and Trauma Center Manager, February 22, 2006).*

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4.6.1b Teton County

Teton County encompasses an area of 2,272.6 sq. miles. The total population of the county is 6,445 persons with a population density of 2.84 individuals per square mile. County population levels have declined by approximately 2.51% between 2000 and 2004 to the current estimate. Choteau is the county seat of Teton County. The only other communities in Teton County are Blackleaf, Dutton, and Fairfield. Eleven public school districts are located within the county.

Demographics

Average family size within Teton County is 3.09 individuals and the average household size is 2.51 individuals. Most individuals own their own home (75.4) while the remainder rent housing. Approximately 12.8 percent of housing units are unoccupied.

Teton County gender, age, and ethnicity demographic data are presented in the insert below.

Gender	**Number**	**Percent of Population within Teton County**	**Percent of Population within Montana**
Male	3,174	49.2	49.8
Female	3,271	50.8	50.2
Age			
15 or younger	1,392	21.4	20.6
16-24	758	13.8	14.4
25-44	1,587	28.1	27.2
45-64	1,635	22.8	24.4
65+	1,073	14.0	13.4
Average Age (years)		39.31	37.38

Source: U.S. Census Bureau 2000 Census: ePodunk

Population estimates of incorporated places within Teton County (as of July 1, 2004) include the following: Choteau (1,758), Dutton (377), and Fairfield (641).

Race	**Number**	**Percent of Population within Teton County**	**Percent of Population within Montana**
White	6,207	96.3	90.6
Black or African American	12	0.2	0.3
American Indian and Alaskan Native	98	1.5	6.2
Asian	6	0.1	0.5
Native Hawaiian and other Pacific Islander	0	0.0	0.1
Some other race	27	0.4	0.6
Two or more races	95	1.5	1.7
Hispanic or latino	73	1.1	2.0

Source: U.S. Census Bureau 2000 Census: ePodunk

Housing Stock

Below is a summary of Teton County's trends for housing stock from 1990-2000.

Teton County – Housing Stock			
Unit Type	**1990 (%)**	**2000 (%)**	**Trend**
Total Units	2,725 (100)	2,910 (100)	6.8% +
Owner Occupied	1,710 (63)	1,914 (66)	11.9% +
Renter Occupied	619 (23)	624 (21)	0.8% +
Vacant	396 (14)	372 (13)	6.0% -
Seasonal	126	145	15.1% +

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Social Characteristics

The social character of Teton County is primarily derived from its rural agricultural roots, and includes values and behavioral attributes consistent with rural Montana, including appreciation of the outdoors and a strong tie to the land. Choteau, the county seat, provides a central location for social activities, though the proximity to Great Falls likely influences to some degree, the ability to travel outside the county for social activities not provided locally. Annual social activities centered in Choteau include local rodeos, Fourth of July celebrations, and an annual threshing bee.

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Economic Activity

Based on the 2000 Census, education, health, and social services were the largest economic sectors in Teton County. Median household income in 2002 was $30,197 (U.S. Census Bureau 2005). Per capita income declined by 4.5% between 1993 and 2003 (adjusted for inflation).

Major industries within Teton County include those listed in the insert below. Approximately 42 percent of the population is not within the labor force.

INDUSTRY	Number of Individuals	Percent of Industry within County
Agriculture, forestry, fishing and hunting, and mining	561	20.6
Construction	139	5.1
Manufacturing	78	2.9
Wholesale trade	95	3.5
Retail trade	258	9.5
Transportation and warehousing, and utilities	165	6.1
Information	148	5.4
Finance, insurance, real estate, and rental and leasing	122	4.5
Professional, scientific, management, administrative, and waste management services	106	3.9
Educational, health and social services	635	23.4
Arts, entertainment, recreation, accommodation and food services	165	6.1
Other services (except public administration)	136	5.0
Public administration	111	4.1

Source: http://factfinder.census.gov

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Countywide information was available for current (2004) earnings by economic sector, as well as for several previous years (back to 2001). Given the availability of this more recent information, 2001-2004 data were utilized to identify trends instead of 1990-2000 data. In general, the data for each county show a positive increase in total wages across most sectors. Teton County experienced a significant decrease in total wages within the Manufacturing Sector, with this decline specifically noted between 2001 and 2002.

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Teton County - Earnings By Sector and Recent Trends in Earnings

INDUSTRY	Total 2004 Wages by Sector (in thousands)	Trend between 2001-2004 (percent change)
Agriculture, forestry, fishing and hunting, and mining	1263	+4.12%
Construction	980	+68.38%
Manufacturing	289	-40.17%
Wholesale trade	4459	+29.28%
Retail trade	3333	+83.23%
Transportation and warehousing, and utilities	3632	+21.55%
Information	6961	+15.38%
Finance, insurance, real estate, and rental and leasing	2698	+39.1%
Professional, scientific, management, administrative, and waste management services	1292	+396%
Educational, health and social services	9927	+22.4%
Arts, entertainment, recreation, accommodation and food services	1209	+3.6%
Other services (except public administration)	483	-13.6%
Public administration	3242	+3%

Source - US Department of Labor Bureau of Statistics (www.bls.gov)

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Countywide information was available for employment and unemployment rates for each county. Data were compiled for the last five years documenting the total labor force available, total employment, total unemployment, and the resulting unemployment rate. In general, unemployment rates have been fairly steady over the last five years, Teton County seeing a small decline (0.5 percent) in total unemployment.

Employment Data and Trends by County 2000-2005(a)

Year	Labor Force	Employment	Unemployment	Unemployment Rate (%)
Teton County				
2000	2,974	2,846	128	4.3
2001	2,926	2,815	111	3.8
2002	2,906	2,796	110	3.8
2003	2,949	2,840	109	3.7
2004	3,001	2,885	116	3.9
2005(b)	3,047	2,931	116	3.8

a – Reflects 2000 Census-based geography, new model controls, 2000 Census inputs.
b - Average through Nov. 2005
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2005. www.bls.gov

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Below is a summary of county revenues and expenditures for the fiscal year ending June 2004. Taxes and assessments (including property tax) made up nearly 48 percent of county revenues in fiscal year ending 2004. Public safety was the largest segment draw on the county budget. For fiscal year 2004-2005, Teton County appropriated $787,037 to its road fund, $64,893 to its Fire Fee District, $15,000 to its rural fire fund, and $3,245 to the Choteau fire fund.

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TETON COUNTY REVENUES AND EXPENDITURES		
General Revenues	**Teton County - 2004**	**Percentages**
REVENUES		
Program Revenues		
Charges for Services	467,055.29	11.2%
General Revenues		
Taxes and Assessments	**1,994,463.18**	**47.8%**
Licenses and permits	1,176.55	0.0%
Intergovernmental revenues	1,605,865.10	38.5%
Investment and royalty earnings	49,245.08	1.2%
Fines and forfeitures	28,571.83	0.7%
TETON COUNTY REVENUES AND EXPENDITURES		
Miscellaneous	25,521.30	0.6%
Subtotal - General Revenues	*3,704,843.04*	*88.8%*
TOTAL REVENUES	**4,171,898.33**	**100.0%**
EXPENSES (by function)		
General Government	712,345.14	15.3%
Public Safety	**1,406,542.03**	**30.2%**
Public Works	895,176.15	19.2%
Public Health	292,395.15	6.3%
Social & Economic Services	114,351.15	2.5%
Culture and Recreation	58,749.18	1.3%
Housing & Community Development	0.00	0.0%
Conservation of natural resources	0.00	0.0%
Capital outlay	502,521.62	10.8%
Internal Services	42,024.87	0.9%
Debt Service Interest	209,509.85	4.5%
Miscellaneous	420,001.14	9.0%
TOTAL EXPENSES	**4,653,616.28**	**100.0%**

School Budget

Below is a summary of the 2005 adopted general fund budget for the Teton County school district. The general fund budget does not include funds for transportation or retirement.

County	**2005 Adopted General Fund Budget**	**Percent of General Fund from County Property Taxes**
Teton	8,935,763	30.9%

Source: Office of Public Instruction (OPI), Helena, Montana

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Public Services

Police Services - Teton County Sheriff's Office covers all of the areas within the County. The office has a force of 9, including the Sheriff and Under Sheriff, and 9 vehicles available for patrol. The County Sheriff's office expects this project may only cause a slight impact to department operations, but nothing that current staffing can't handle. This would likely be similar to other large construction projects they've seen before and the impacts have been slight. (Personal communication with Lisa Stoltz, Teton County Sheriff's Office, February 22, 2006).

Fire Services - There are 5 known fire departments in Teton County. These include:

- Choteau Volunteer Fire Department
- Dutton Rural Fire Department
- Fairfield Rural Fire District
- Pendroy Volunteer Fire Company
- Power Volunteer Fire Company

No significant impacts are foreseen for fire services in Teton County given the current level of service available, and responses given by fire service providers in other Project Area counties.

Health and Emergency Services - Teton Medical Center is a 10-bed critical access hospital and 36-bed extended care facility located in Choteau. Teton Medical Center provides inpatient and outpatient services, radiology services, and a full-service laboratory. The hospital provides 24-hour emergency services, with two rooms staffed by physicians, physician assistants and nurses. Similar to other hospital services identified within the project area, the proposed project is not anticipated to impact Teton Medical Center's services.

Chouteau County

Chouteau County includes 3,973 sq. miles in land area with a population density of 1.50 individuals per square mile. County population levels have declined by 6.62% between 2000 and 2004 to a current estimated population of 5,575 individuals.

Communities within Chouteau County include: Big Sandy, Box Elder, Carter, Fort Benton, Geraldine, Iliad, Loma, and Shonkin. Fort Benton is the county seat. Thirteen public school districts are located within the county as well as Stone Child College in Box Elder.

Demographics

Average family size within Chouteau County is 3.11 individuals and the average household size is 2.59 individuals. Most individuals own their own home (68.8) while the remainder rent housing. Vacant housing accounts for 19.8 percent of total housing within Chouteau County. General demographic data for Chouteau County including gender, age, and ethnicity profiles are presented in the insert below.

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Gender	Number	Percent of Population within Chouteau County	Percent of Population within Montana
Male	2,997	50.2	49.8
Female	2,973	49.8	50.2
Age			
15 or younger	1,384	23.2	20.6
16-24	724	12.1	14.4
25-44	1,437	24.1	27.2
45-64	1,382	23.1	24.4
65+	1,043	17.5	13.4
Average Age (years)		38.65	37.38

Source: U.S. Census Bureau 2000 Census: ePodunk

Similar to other counties within the Project Study Area, the majority of the population within Chouteau County is identified as "white". The percentage of race and ethnicity within the county is presented below by major ethnic groups.

Race or Ethnicity	Number	Percent of Population within Chouteau County	Percent of Population within Montana
White	5,015	84.0	90.6
Black or African American	5	0.1	0.3
American Indian and Alaskan Native	873	14.6	6.2
Asian	14	0.2	0.5
Native Hawaiian and other Pacific Islander	6	0.1	0.1
Some other race	14	0.2	0.6
Two or more races	43	0.7	1.7
Hispanic or latino	40	0.7	2.0

Source: U.S. Census Bureau 2000 Census: ePodunk

Population estimates of incorporated places within Chouteau County include: Big Sandy (656), Fort Benton (1,506), and Geraldine (264).

Housing Stock

Below is a summary of Chouteau County's trends for housing stock from 1990-2000.

Chouteau County – Housing Stock			
Unit Type	**1990 (%)**	**2000 (%)**	**Trend**
Total Units	2,668 (100)	2,776 (100)	4.0% +
Owner Occupied	1,431 (54)	1,531 (55)	7.0% +
Renter Occupied	633 (24)	695 (25)	9.8% +
Vacant	604 (46)	550 (20)	8.9% -
Seasonal	162	128	21.0% -

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Social Characteristics

Similar to Teton County, social character of Chouteau County is rooted in its rural agricultural past, and is consistent with those attributes associated with rural Montana including outdoor appreciation, outdoor activities, and small town values. The county seat of Chouteau County is the community of Fort Benton, which annually host several social events including the Choteau County Fair and the Fort Benton Summer Celebration.

Economic Activity

Economic data from 2004 indicate that within Chouteau County the largest economic sector was agriculture. In 2002, the per capita personal income in Chouteau County was $22,081. This was an increase of 5.3 percent from 1997. Median household income in 2002 was $29,150 (U.S. Census Bureau 2005).

Major industries within Chouteau County include those listed below. Approximately 38 percent of the population is not within the labor force (see Insert below).

INDUSTRY	Number of Individuals	Percent of Industry within County
Agriculture, forestry, fishing and hunting, and mining	849	32.7
Construction	125	4.8
Manufacturing	80	3.1
Wholesale trade	42	1.6
Retail trade	224	8.6
Transportation and warehousing, and utilities	74	2.8
Information	35	1.3
Finance, insurance, real estate, and rental and leasing	125	4.8
Professional, scientific, management, administrative, and waste management services	61	2.3
Educational, health and social services	573	22.0
Arts, entertainment, recreation, accommodation and food services	157	6.0
Other services (except public administration)	114	4.4
Public administration	141	5.4

Source: http://factfinder.census.gov

Countywide information was available for current (2004) earnings by economic sector, as well as for several previous years (back to 2001). Given the availability of this more recent information, 2001-2004 data were utilized to identify trends instead of 1990-2000 data. In general, the data for each county show a positive increase in total wages across most sectors. There are a few exceptions noted. Chouteau County saw a marked decrease in the Financial Activities sector (e.g., finance, insurance, real estate, and rental and leasing); a majority of this decrease occurring between 2002 and 2003.

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Chouteau County - Earnings By Sector and Recent Trends in Earnings

INDUSTRY	Total 2004 Wages by Sector (in thousands)	Trend between 2001-2004 (percent change)
Agriculture, forestry, fishing and hunting, and mining	1765	+23.0%
Construction	433	+42.43%
Manufacturing	444	-5.7%
Wholesale trade	1678	+71.4%
Retail trade	2837	+11.65%
Transportation and warehousing, and utilities	793	+25.28%
Information	N/A[1]	N/A[1]
Finance, insurance, real estate, and rental and leasing	864	-42.32%
Professional, scientific, management, administrative, and waste management services	N/A[1]	N/A[1]
Educational, health and social services	9192	+5.62%
Arts, entertainment, recreation, accommodation and food services	1182	+32.51%
Other services (except public administration)	233	+29.44%
Public administration	2769	+12.84%

Source - US Department of Labor Bureau of Statistics (www.bls.gov)
N/A[1] – Not Disclosed: Data does not meet BLS or State agency disclosure standards

Countywide information was available for employment and unemployment rates for each county. Data were compiled for the last five years documenting the total labor force available, total employment, total unemployment, and the resulting unemployment rate. Chouteau County saw a slight increase (less than 1 percent) in unemployment over this time period

Employment Data and Trends by County 2000-2005(a)

Year	Labor Force	Employment	Unemployment	Unemployment Rate (%)
Chouteau County				
2000	2,799	2,698	101	3.6
2001	2,723	2,629	94	3.5
2002	2,474	2,387	87	3.5
2003	2,518	2,437	81	3.2
2004	2,633	2,454	88	3.3
2005(b)	2,694	2,590	104	3.9

a – Reflects 2000 Census-based geography, new model controls, 2000 Census inputs.
b - Average through Nov. 2005
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2005. www.bls.gov

The table below provides a summary of county revenues and expenditures for the fiscal year ending June 2005. Property tax made up nearly 50 percent of county revenues in fiscal year 2004-2005. Public Works was the largest segment draw on the county budget. For fiscal year 2004-2005, Choteau County appropriated $1,324,911 to its road fund. No specific rural fire district fund was identified in Chouteau County's most recent tax levy requirements schedule.

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CHOUTEAU COUNTY REVENUES AND EXPENDITURES		
General Revenues	**Chouteau County - 2005**	**Percentages**
REVENUES		
Program Revenues		
Charges for Services	562,847	11.2%
Operating Grants and Contributions	489,625	9.7%
Capital Grants & Contributions	25,321	0.5%
Subtotal - Program Revenues	*1,077,793*	*21.4%*
General Revenues		
Property tax	**2,502,098**	**49.7%**
Local option tax	184,907	3.7%
Licenses and permits	495	0.0%
Unrestricted fed/state share revenue	1,096,900	21.8%
Unrestricted grants and contributions	0	0.0%
Unrestricted investment earnings	104,205	2.1%
Miscellaneous	42,575	0.8%
Gain on sale of property and equipment	28,561	0.6%
Subtotal - General Revenues	*3,959,741*	*78.6%*
TOTAL REVENUES	**5,037,534**	**100.0%**
CHOUTEAU COUNTY REVENUES AND EXPENDITURES		
EXPENSES (by function)		
General Government	1,203,539	23.6%
Public Safety	1,012,127	19.8%
Public Works	**1,986,477**	**38.9%**
Public Health	205,097	4.0%
Social & Economic Services	149,712	2.9%
Culture and Recreation	395,235	7.7%
Housing & Community Development	4,000	0.1%
Debt Service Interest	26,194	0.5%
Miscellaneous	121,350	2.4%
TOTAL EXPENSES	**5,103,731**	**100.0%**

School Budget

Below is a summary of the 2005 adopted general fund budget for the Chouteau County school district. The general fund budget does not include funds for transportation or retirement.

County	**2005 Adopted General Fund Budget**	**Percent of General Fund from County Property Taxes**
Chouteau	6,058,450	42.4%

Source: Office of Public Instruction (OPI), Helena, Montana

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Public Services

Police Services - The Chouteau County Sheriff's Office covers the towns of Big Sandy, Loma, Carter, Highwood, Square Butte, and Geraldine; as well as all rural areas within Chouteau County. Fort Benton has its own City Police Department. The County Sheriff's Office has a force of 9 full time officers and a reserve force of 8 and is responsible for the investigation and prevention of crime, coroner duties, fire warden, civil process, bailiff, search and rescue, and emergency services response. Eight patrol cars and 2 suburbans are available for patrol. The Sheriff indicated that based on past experiences with oil/gas pipelines; he would expect no negative effect on services. However he did request that the company provide his office with periodic updates/briefs about the timing and location of expected construction so that appropriate emergency services personnel can be prepared in case problems arise *(personal communication with Vern Burdick, Chouteau County Sheriff, February 23, 2006).*

The City of Fort Benton has 3 full-time officers, 4 part-time officers and 2 patrol vehicles. The Chief of the Fort Benton Police Department indicated that construction projects of this type often do have some impacts. Generally there can be an increased call for law enforcement services when crews are off duty (drinking/fighting, etc.). The Department has dealt with large construction projects in the past and should be able to handle any increases due to this project as well (*personal communication with John Turner, Chief, Fort Benton Police Department, February 22, 2006*).

Fire Services - There are 8 volunteer fire departments within Chouteau County.

- The Fort Benton Volunteer Fire Department has approximately 22 firefighters on its roster, 2 city trucks and 4 rural trucks.
- The Big Sandy Volunteer Fire Department has approximately 30 firefighters on its roster, 1 city truck and 9 rural trucks.
- The Geraldine Volunteer Fire Department has approximately 8 firefighters on its roster, and 3 combination (structure/rural) trucks.
- The Highwood Volunteer Fire Department has 15 firefighters on its roster, and 4 combination (structure/rural) trucks.
- The Loma Volunteer Fire Department has 9 firefighters on its roster, and 3 combination (structure/rural) trucks.
- The Carter Volunteer Fire Department has 15 firefighters on its roster, and 3 rural trucks.
- The Kness Volunteer Fire Department has 12 firefighters on its roster, and 3 rural trucks.
- The Elim Volunteer Fire Department has 7 firefighters on its roster, and 2 rural trucks.

There are also 5 volunteer quick response units on call within the county for emergency/fire situations, and 3 ambulance services. They are located in Fort Benton (2 vehicles), Big Sandy (2 vehicles), and Geraldine (1 vehicle).

Similar to the discussion regarding law enforcement, based on past experiences with oil/gas pine lines, there has been no negative effects on services. However, the County Sheriff's office, responsible for coordinating emergency services locally, asked that the company provide his office with periodic updates/briefs about the timing and location of expected construction so that appropriate emergency services personnel can be prepared in case any problems arise *(personal communication with Vern Burdick, Chouteau County Sheriff, February 23, 2006).*

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Health and Emergency Services - The Missouri River Medical Center (MRMC) in Fort Benton provides a 7-bed acute care hospital, emergency room, laboratory, and radiology department. The MRMC Emergency room is available 24 hours a day, seven days a week, and is staffed by a Registered Nurse with a physician on call. MRMC coordinates emergency services with Memorial Ambulance, Geraldine Ambulance, Benefis Healthcare, Mercy Flight and Chouteau County. The project is anticipated to have few impacts and nothing that MRMC couldn't handle (*per email correspondence with MRMC staff, February 22, 2006*)

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Pondera County

The land area of Pondera County encompasses 1,624.7 sq. miles with a population density of 3.95 individuals per square mile. County population levels have declined by 4.30% between 2000 and 2004 to a current estimated population of 6,424 individuals.

Communities within Pondera County include Conrad, Heart Butte, and Valier. Conrad is the county seat. Nine public school districts are located within the county.

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Demographics

Average family size within Pondera County is 3.18 individuals and the average household size is 2.63 individuals. Most individuals own their own home (70.5) while the remainder rent housing. Fifteen percent of housing is vacant in Pondera County.

General demographic data for Pondera County including gender, age, and ethnicity profiles are presented in the insert below.

Gender	**Number**	**Percent of Population within Pondera County**	**Percent of Population within Montana**
Male	3,169	49.3	49.8
Female	3,255	50.7	50.2
Age			
15 or younger	1,503	23.4	20.6
16-24	810	12.6	14.4
25-44	1,594	24.8	27.2
45-64	1,473	22.9	24.4
65+	1,044	16.3	13.4
Average Age (years)		37.98	37.38

Source: U.S. Census Bureau 2000 Census: ePodunk

Population estimates of incorporated places within Pondera County include Conrad (2,638) and Valier (479).

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Race or Ethnicity	Number	Percent of Population within Pondera County	Percent of Population within Montana
White	5,374	83.7	90.6
Black or African American	6	0.1	0.3
American Indian and Alaskan Native	929	14.5	6.2
Asian	9	0.1	0.5
Native Hawaiian and other Pacific Islander	3	0.1	0.1
Some other race	8	0.1	0.6
Two or more races	95	1.5	1.7
Hispanic or latino	54	0.8	2.0

Source: U.S. Census Bureau 2000 Census: ePodunk

Housing Stock

The table below provides an overview of housing stock trends in Pondera County from 1990-2000.

Pondera County (Housing Stock)			
Unit Type	**1990 (%)**	**2000 (%)**	**Trend**
Total Units	2,618 (100)	2,834 (100)	8.3% +
Owner Occupied	1,562 (60)	1,699 (60)	8.8% +
Renter Occupied	684 (26)	711 (25)	3.9% +
Vacant	372 (14)	424 (15)	14.0% +
Seasonal	64	46	28.1% -

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Social Characteristics

Pondera County is similar to other rural Montana counties in that its social and demographic character are rooted in its agricultural past. Social events held in the county include local rodeos, annual Christmas stroll, and various community events held throughout the year.

Economic Activity

Similar to several other counties within the Project Study Area, economic data from 2004 indicate that within Pondera County the largest economic sector was education, health, and social services. Agriculture was also a large industry within the county with 20.2 percent of individuals employed in that sector. In 2002, the per capita personal income in Pondera County was $21,871. This was an increase of 12.9% from 1997. Median household income in 2002 was $30,464 (U.S. Census Bureau 2005).

Major industries within Pondera County are shown below. Approximately 39.2 percent of the population is not within the labor force.

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INDUSTRY	Number of Individuals	Percent of Industry within County
Agriculture, forestry, fishing and hunting, and mining	546	20.2
Construction	119	4.4
Manufacturing	54	2.0
Wholesale trade	83	3.1
Retail trade	366	13.6
Transportation and warehousing, and utilities	129	4.8
Information	29	1.1
Finance, insurance, real estate, and rental and leasing	76	2.8
Professional, scientific, management, administrative, and waste management services	121	4.5
Educational, health and social services	658	24.4
Arts, entertainment, recreation, accommodation and food services	182	6.7
Other services (except public administration)	164	6.1
Public administration	172	6.4

Countywide information was available for current (2004) earnings by economic sector, as well as for several previous years (back to 2001). Given the availability of this more recent information, 2001-2004 data were utilized to identify trends instead of 1990-2000 data. In general, the data show a positive increase in total wages across most sectors. There are a few exceptions noted. Pondera experienced a marked decrease in total wages within the Natural Resources and Mining sector (agriculture, forestry, mining etc.) and manufacturing sector.

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Pondera County - Earnings By Sector and Recent Trends in Earnings

INDUSTRY	Total 2004 Wages by Sector (in thousands)	Trend between 2001-2004 (percent change)
Agriculture, forestry, fishing and hunting, and mining	748	-24.67%
Construction	9193	+14.88%
Manufacturing	1021	-23.7%
Wholesale trade	3117	+9.7%
Retail trade	4016	+15.43%
Transportation and warehousing, and utilities	6324	+9.03%
Information	449	+39.44%
Finance, insurance, real estate, and rental and leasing	1908	+1.76%
Professional, scientific, management, administrative, and waste management services	1497	+6.4%
Educational, health and social services	13022	+4.48%
Arts, entertainment, recreation, accommodation and food services	1180	+21.65%
Other services (except public administration)	523	-2.8%
Public administration	847	+5.35%

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Source - US Department of Labor Bureau of Statistics (www.bls.gov)

Countywide information was available for employment and unemployment rates for each county. Data were compiled for the last five years documenting the total labor force available,

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total employment, total unemployment, and the resulting unemployment rate. Pondera County saw a slight increase in the overall unemployment rate during this timeframe.

Employment Data and Trends by County 2000-2005(a)

Year	Labor Force	Employment	Unemployment	Unemployment Rate (%)
Pondera County				
2000	2,976	2,836	140	4.7
2001	2,892	2,771	121	4.2
2002	2,745	2,630	124	4.5
2003	2,771	2,641	130	4.7
2004	2,715	2,568	147	5.4
2005(b)	2,764	2,612	152	5.5

a – Reflects 2000 Census-based geography, new model controls, 2000 Census inputs.
b - Average through Nov. 2005
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2005. www.bls.gov

The table below provides a summary of county revenues and expenditures for the fiscal year ending June 2005. Property tax made up nearly 50 percent of county revenues in fiscal year 2004-2005. Largest segment draws on the county budget include public works and general government expenditures. For fiscal year 2004-2005, Pondera County appropriated $925,355 to its road fund and $20,891 to its rural fire district fund.

PONDERA COUNTY REVENUES AND EXPENDITURES

REVENUES	**Pondera County - 2005**	**Percentages**
Program Revenues		
Charges for Services	362,746	8.5%
Operating Grants and Contributions	515,880	12.1%
Capital Grants & Contributions	133,991	3.1%
Subtotal - Program Revenues	*1,012,617*	*23.7%*
General Revenues		
Property tax	**2,126,632**	**49.7%**
Personal Property Reimbursement	54,335	1.3%
Misc.	266,934	6.2%
Investment Earnings & Oil Royalties	76,006	1.8%
PILT	139,789	3.3%
MT Oil and Gas Production Tax	206,805	4.8%
State Entitlement	354,411	8.3%
Grants & Entitlements no restricted to specific program	42,886	1.0%
Subtotal - General Revenues	*3,267,798*	*76.3%*
TOTAL REVENUES	**4,280,415**	**100.0%**

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PONDERA COUNTY REVENUES AND EXPENDITURES (cont.)		
EXPENSES (by function)		
General Government	**1,156,213**	**26.3%**
Public Safety	862,734	19.6%
Public Works	**1,160,558**	**26.4%**
Public Health	540,966	12.3%
Social & Economic Services	87,790	2.0%
Culture and Recreation	138,049	3.1%
Housing & Community Development	250,791	5.7%
Miscellaneous	116,360	2.6%
Debt Service Costs & Fees	0	0.0%
Debt Service Interest	81,212	1.8%
TOTAL EXPENSES	**4,394,673**	**100.0%**

School Budget

Below is a summary of the 2005 adopted general fund budget for the Pondera County school district. The general fund budget does not include funds for transportation or retirement.

County	**2005 Adopted General Fund Budget**	**Percent of General Fund from County Property Taxes**
Pondera	6,592,101	24.3%

Source: Office of Public Instruction (OPI), Helena, Montana

Public Services

Police Services - The Pondera County Sheriff's Office covers all areas of the County with the exception of the Conrad, and reservation lands. The Sheriff's office has a force of 8 fulltime officers, and 8 vehicles are available for patrol. Conrad is covered via the City Police Department, with a staff of 5 and 2 vehicles available for patrol. The Bureau of Indian Affairs handles law enforcement on reservation lands in the western part of the county. The County Sheriff's office does not expect this project to cause an impact on department operations. An additional influx of temporary employees also would not cause an increase in the department's workload. (*Personal communication with Judy Sawyer, Pondera County Police Department, February 22, 2006*).

Fire Services - There are 4 fire departments throughout Pondera County. These include:

- Brady Volunteer Fire Department
- Conrad Volunteer Fire Department
- Dupuyer Volunteer Fire Department
- Valier Volunteer Fire Department

Combined the 4 departments have 79 volunteer firefighters and 16 trucks. The department does not expect the project to significantly impact current fire services for this area *(personal communication, Roger Keith, Secretary of the Rural Fire District Board, February 22, 2006).* There is also 1 department located in Heart Butte which falls under the Bureau of Indian Affairs.

Health and Emergency Services - Pondera Medical Center, located in Conrad, is a 20-bed acute care facility, with a full range of services, including surgery, laboratory, and radiology. There are 5 local physicians, and 5 allied staff at the facility, and a variety of visiting specialists.

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Pondera Medical Center Surgery Department has multiple surgical capabilities including orthopedics, general surgery, laparoscopic surgery, and podiatry. Pondera Medical Center provides 24-hour emergency room coverage staff by a Physician Assistant and Nurse Practitioner, with physician backup. Pondera County Ambulance, staffed with Emergency Medical Technicians, serves the Pondera County area with round-the-clock emergency services. The ambulance also provides transportation services for patients to other facilities as necessary. Similar to other hospital services identified within the project area, the proposed project is not anticipated to impact Pondera Medical Center's services.

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Toole County

The total estimated population of Toole County in 2004 was 5,267 individuals. Land area of the county is 1,910.9 sq. miles and supports a density of 2.76 individuals per square mile. The county population has declined by 3.28 percent between 2000 and 2004.

Communities within Toole County include Gold Butte, Kevin, Sunburst, and Sweetgrass. Shelby is the county seat. Four public school districts are located within the county.

Demographics

Average family size within Toole County is 3.09 individuals and the average household size is 2.47 individuals. Most individuals own their own home (71.2) while the remainder rent housing. Vacant housing accounts for 14.7 percent of total housing within Toole County.

General demographic data for Toole County including gender, age, and ethnicity profiles are presented below.

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Gender	**Number**	**Percent of Population within Toole County**	**Percent of Population within Montana**
Male	2,716	51.6	49.8
Female	2,551	48.4	50.2
Age			
15 or younger	1,066	20.2	20.6
16-24	638	12.1	14.4
25-44	1,484	28.2	27.2
45-64	1,242	23.6	24.4
65+	837	15.9	13.4
Average Age (years)		38.79	37.38

Source: U.S. Census Bureau 2000 Census: ePodunk

Population estimates of incorporated places within Toole County include Kevin (155), Shelby (3,304) and Sunburst (362).

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Race or Ethnicity	Number	Percent of Population within Toole County	Percent of Population within Montana
White	4,945	93.9	90.6
Black or African American	8	0.2	0.3
American Indian and Alaskan Native	168	3.2	6.2
Asian	16	0.3	0.5
Native Hawaiian and other Pacific Islander	1	0.1	0.1
Some other race	17	0.3	0.6
Two or more races	112	2.1	1.7
Hispanic or latino	61	1.2	2.0

Source: U.S. Census Bureau 2000 Census: ePodunk

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Housing Stock

The table below provides an overview of housing stock trends in Toole County from 1990-2000.

Toole County			
Unit Type	**1990 (%)**	**2000 (%)**	**Trend**
Total Units	2,354 (100)	2,300 (100)	2.3% -
Owner Occupied	1,381 (59)	1,396 (61)	1.1% +
Renter Occupied	541 (23)	566 (25)	4.6% +
Vacant	432 (18)	338 (14)	21.8% -
Seasonal	46	46	0.0%

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Social Characteristics

Toole County, of which the county seat is Shelby, has a rural agricultural origin. Being located along the route of the BNSF Railroad has had a hand in shaping to some extent, a portion of the demographic and social makeup of the area. Social events typical of the Shelby area include the annual Shelby community picnic and the Marias 4 County Fair.

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Economic Activity

The largest economic sector in Toole County was education, health, and social services. Agriculture was also a large industry within the county accounting for 15.4 percent of individuals employed in that sector. Per capita personal income in 2002 was $21,835, an increase of 5.2 percent from 1997. Median household income in 2002 was $30,169 (U.S. Census Bureau 2005).

Major industries within Toole County are shown below. Approximately 42.2 percent of the population is not within the labor force.

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INDUSTRY	Number of Individuals	Percent of Industry within County
Agriculture, forestry, fishing and hunting, and mining	352	15.4
Construction	105	4.6
Manufacturing	35	1.5
Wholesale trade	93	4.1
Retail trade	212	9.3
Transportation and warehousing, and utilities	171	7.5
Information	53	2.3
Finance, insurance, real estate, and rental and leasing	122	5.4
Professional, scientific, management, administrative, and waste management services	92	4.0
Educational, health and social services	502	22.0
Arts, entertainment, recreation, accommodation and food services	238	10.4
Other services (except public administration)	87	3.8
Public administration	218	9.6

Countywide information was available for current (2004) earnings by economic sector, as well as for several previous years (back to 2001). Given the availability of this more recent information, 2001-2004 data were utilized to identify trends instead of 1990-2000 data. In general, the data shows a positive increase in total wages across most sectors.

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Toole County - Earnings By Sector and Recent Trends in Earnings

INDUSTRY	Total 2004 Wages by Sector (in thousands)	Trend between 2001-2004 (percent change)
Agriculture, forestry, fishing and hunting, and mining	4287	+19.82%
Construction	833	+33.28%
Manufacturing	424	-6.2%
Wholesale trade	2759[1]	N/A[2]
Retail trade	3652	+33%
Transportation and warehousing, and utilities	473	+1.94%
Information	1449	+54.3%
Finance, insurance, real estate, and rental and leasing	2087	+29.55%
Professional, scientific, management, administrative, and waste management services	5343	+27.8
Educational, health and social services	10370	+20.34%
Arts, entertainment, recreation, accommodation and food services	3304	+47.3%
Other services (except public administration)	373	-3.1%
Public administration	8130	+228.4%

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Source - US Department of Labor Bureau of Statistics (www.bls.gov)
[1] – 2002 Data, No Data Available for 2004
N/A[2]– Not Available: comparison data does not meet BLS or State agency disclosure standards

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Countywide information was available for employment and unemployment rates for each county. Data were compiled for the last five years documenting the total labor force available,

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total employment, total unemployment, and the resulting unemployment rate. In general, unemployment rates have been fairly steady over the last five years, with Toole County seeing a small decline (0.5 percent) in total unemployment.

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Employment Data and Trends by County 2000-2005(a)

Year	Labor Force	Employment	Unemployment	Unemployment Rate (%)
Toole County				
2000	2,523	2,422	101	4.0
2001	2,429	2,346	83	3.4
2002	2,348	2,266	82	3.5
2003	2,538	2,453	85	3.3
2004	2,586	2,500	86	3.3
2005(b)	2,661	2,568	93	3.5

a – Reflects 2000 Census-based geography, new model controls, 2000 Census inputs.
b - Average through Nov. 2005
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2005. www.bls.gov

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The table below provides a summary of county revenues and expenditures for the fiscal year ending June 2005. Taxes and assessments (includes property tax) made up about 39 percent of county revenues in fiscal year 2004-2005, however intergovernmental revenues (state/fed) made up over 55 percent of county revenue that fiscal year. Largest segment draws on the county budget include public health and general government expenditures. For fiscal year 2004-2005, Toole County appropriated $910,275 to its road fund and $88,000 to its ambulance fund. No specific rural fire district fund was identified in Toole County's most recent tax levy requirements schedule.

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TOOLE COUNTY REVENUES AND EXPENDITURES		
General Revenues	**Toole County - 2005**	**Percentages**
REVENUES		
Program Revenues		
Charges for Services	386,200.70	4.9%
General Revenues		
Taxes and Assessments	**3,026,167.00**	**38.7%**
Licenses and permits	0.00	0.0%
Intergovernmental revenues	**4,338,654.10**	**55.4%**
Investment and royalty earnings	-191,642.80	-2.4%
Fines and forfeitures	167,446.40	2.1%
Miscellaneous	100,049.50	1.3%
Subtotal - General Revenues	*7,440,674.20*	*95.1%*
TOTAL REVENUES	**7,826,874.90**	**100.0%**

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TOOLE COUNTY REVENUES AND EXPENDITURES (cont.)		
EXPENSES (by function)		
General Government	**1,329,310.00**	**20.5%**
Public Safety	965,743.00	14.9%
Public Works	967,573.00	14.9%
Public Health	**1,308,933.00**	**20.2%**
Social & Economic Services	587,302.00	9.1%
Culture and Recreation	462,612.00	7.1%
Housing & Community Development	10,800.00	0.2%
Conservation of natural resources	53,582.00	0.8%
Capital outlay	344,603.00	5.3%
Internal Services	9,212.00	0.1%
Miscellaneous	445,985.00	6.9%
TOTAL EXPENSES	**6,485,655.00**	**100.0%**

School Budget

Below is a summary of the 2005 adopted general fund budget for the Toole County school district. The general fund budget does not include funds for transportation or retirement.

County	2005 Adopted General Fund Budget	Percent of General Fund from County Property Taxes
Toole	5,509,576	24.6%

Source: Office of Public Instruction (OPI), Helena, Montana

Public Services

Police Services - Toole County Sheriff's Office covers all of Toole County, including Shelby. The office has a force of 12, including the Sheriff, and 6 vehicles available for patrol. This project is not expected to cause an impact on department operations, particularly given that project alternatives are all located to the west. An additional influx of temporary employees also would not cause an increase in the department's workload. (*Personal communication with Rosalie Manley, Toole County Sheriff's Office, February 22, 2006*).

Fire Services - There are 2 volunteer fire departments located within Toole County. The Shelby Volunteer Fire Department provides fire services for Shelby and southern Toole County. They have 21 firefighters, 3 city trucks and 5 rural trucks available. The department does not expect the project to significantly impact current fire services for this area *(personal communication, Ron Buck, Assistant Chief, Shelby Volunteer Fire Department, February 22, 2006).* There is also a volunteer fire department that serves northern Toole County located in Sunburst. They have 21 firefighters, 2 local trucks, 1 city truck, 1 water tender, and 5 rural trucks available. The department also does not expect the project to significantly impact current fire services for this area *(personal communication, Don McAlpine, Chief, Sunburst Volunteer Fire Department, February 22, 2006).*

Health and Emergency Services - Marias Medical Center is a combined 20-bed acute hospital with nursery, maternity rooms, ICU, CCU units and a 68-bed skilled nursing facility that provides restorative and rehabilitation care. The facility has an emergency room, birthing room, and

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operating room, all equipped with the latest technology, including MDE Telemetry, a blood warmer, Plum X-L IV pumps; one for each patient's room, ER, and OB room. The ER has a physician on call 24 hours a day and a surgeon is also available as needed, as well as an anesthetist. The facility has 15 RN's on staff. They have 4 ambulances that serve Toole County, 1 is housed in Sunburst (which is 35 miles north of Shelby). They also have a helipad at the hospital and can do fixed wing transfers from the airport just north of Shelby. Marias Medical Center also has an ongoing disaster plan that includes surrounding counties. Marias Medical Center would be able to accommodate any increase in activity due to the influx of additional construction workers (*per email correspondence with Denise McCormick, Director of Nurses, February 22, 2006*).

Glacier County

After Cascade County, Glacier County is the most populous county within the Project Study Area with an estimated 2004 population of 13,508 individuals. Land area of the county is 2,994.7 sq. miles and supports a density of 4.42 individuals per square mile. The county population has increased by 1.97 percent between 2000 and 2004.

Communities within Glacier County include Babb, Browning, Cut Bank, Del Bonita, and Saint Mary. Cut Bank is the county seat. Six public school districts are located within the county as well as Blackfeet Community College in Browning. The Blackfeet Reservation accounts for the majority of Glacier County's area. Glacier National Park borders Glacier County to the west.

Demographics

Average family size within Glacier County is 3.56 individuals and the average household size is 3.03 individuals. Most individuals own their own home (62.0) while the remainder rent housing. Vacant housing accounts for 17.9 percent of total housing within Toole County.
Gender, age, and ethnicity profiles for Glacier County are presented below.

Gender	**Number**	**Percent of Population within Glacier County**	**Percent of Population within Montana**
Male	6,553	49.5	49.8
Female	6,694	50.5	50.2
Age			
15 or younger	3,757	28.4	20.6
16-24	2,067	15.6	14.4
25-44	3,560	26.9	27.2
45-64	2,642	19.9	24.4
65+	1,221	9.2	13.4
Average Age (years)		32.48	37.38

Source: U.S. Census Bureau 2000 Census: ePodunk

Population estimates of incorporated places within Glacier County include Browning (1,084) and Cut Bank (3,155).

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Race or Ethnicity	Number	Percent of Population within Glacier County	Percent of Population within Montana
White	4,693	35.4	90.6
Black or African American	11	0.1	0.3
American Indian and Alaskan Native	8,186	61.8	6.2
Asian	9	0.1	0.5
Native Hawaiian and other Pacific Islander	7	0.1	0.1
Some other race	24	0.2	0.6
Two or more races	317	2.4	1.7
Hispanic or latino	159	1.2	2.0

Source: U.S. Census Bureau 2000 Census: ePodunk

Housing Stock

The table below provides an overview of housing stock trends in Glacier County from 1990-2000.

Glacier County – Housing Stock			
Unit Type	**1990 (%)**	**2000 (%)**	**Trend**
Total Units	4,797 (100)	5,243 (100)	9.2% +
Owner Occupied	2,325 (48)	2,670 (51)	14.8% +
Renter Occupied	1,491 (31)	1,634 (31)	9.6% +
Vacant	981 (21)	939 (18)	4.3% -
Seasonal	447	386	13.6% -

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Social Characteristics

Similar to the other rural counties discussed above, Glacier County has a rural agricultural history. Additionally, oil and gas exploration, rail activity, and the Blackfeet Indian Reservation have shaped and continue to shape the social character of the area. Social activities that traditionally occur in Glacier County include the annual Lewis and Clark festival and the Montana Fun Weekend.

Economic Activity

The largest economic sector in Glacier County was education, health, and social services (31.3 percent). Public administration was also a large industry within the county accounting for 15.2 percent of individuals employed in that sector. Per capita personal income in 2002 in Glacier County was $18,192, an increase of 24.3% from 1997. Median household income in 2002 was $27,922 (U.S. Census Bureau 2005).

Major industries within Glacier County are shown below. Approximately 38.4 percent of the population is not within the labor force.

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INDUSTRY	Number of Individuals	Percent of Industry within County
Agriculture, forestry, fishing and hunting, and mining	444	9.3
Construction	275	5.8
Manufacturing	65	1.4
Wholesale trade	47	1.0
Retail trade	461	9.7
Transportation and warehousing, and utilities	260	5.5
Information	76	1.6
Finance, insurance, real estate, and rental and leasing	125	2.6
Professional, scientific, management, administrative, and waste management services	207	4.4
Educational, health and social services	1,489	31.3
Arts, entertainment, recreation, accommodation and food services	310	6.5
Other services (except public administration)	269	5.7
Public administration	722	15.2

Countywide information was available for current (2004) earnings by economic sector, as well as for several previous years (back to 2001). Given the availability of this more recent information, 2001-2004 data were utilized to identify trends instead of 1990-2000 data. In general, the data for Glacier County show a positive increase in total wages across most sectors. Some exceptions are noted. These include construction, manufacturing, and the transportation, warehousing and utility sectors

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Glacier County - Earnings By Sector and Recent Trends in Earnings

INDUSTRY	Total 2004 Wages by Sector (in thousands)	Trend between 2001-2004 (percent change)
Agriculture, forestry, fishing and hunting, and mining	4939	+90.62%[1]
Construction	2726	-5.05%
Manufacturing	583	-15.87%[1]
Wholesale trade	3056	+29.66%
Retail trade	8102	+22.39%
Transportation and warehousing, and utilities	3081	-6.8%
Information	309	+6.19%
Finance, insurance, real estate, and rental and leasing	2158	+13.04%
Professional, scientific, management, administrative, and waste management services	2195	+21.2%
Educational, health and social services	27113	+28.52%
Arts, entertainment, recreation, accommodation and food services	12640	+1.93%
Other services (except public administration)	1311	-13.8%
Public administration	36200	+11.47%

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Source - US Department of Labor Bureau of Statistics (www.bls.gov)
[1] – 2002 Data, No Comparison Data Available for 2001

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Countywide information was available for employment and unemployment rates for each county. Data were compiled for the last five years documenting the total labor force available, total employment, total unemployment, and the resulting unemployment rate. Glacier County has the highest unemployment rate in the region, currently at 8 percent, though this has fluctuated from a high of 8.2 percent to a low of 6.9 percent over the last five years

Employment Data and Trends by County 2000-2005(a)

Year	Labor Force	Employment	Unemployment	Unemployment Rate (%)
Glacier County				
2000	5,715	5,248	467	8.2
2001	5,775	5,348	427	7.4
2002	5,585	5,199	386	6.9
2003	5,750	5,315	435	7.6
2004	5,942	5,466	476	8.0
2005(b)	6,105	5,614	491	8.0

a – Reflects 2000 Census-based geography, new model controls, 2000 Census inputs.
b - Average through Nov. 2005
Source: U.S. Department of Labor, Bureau of Labor Statistics, 2005. www.bls.gov

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Below is a summary of county revenues and expenditures for the fiscal year ending June 2005. Property tax made up nearly 38 percent of county revenues in fiscal year 2004-2005. Largest segment draws on the county budget include public safety, public works, and general government expenditures; all tapping between 28 to 30 percent of revenue, respectively. For fiscal year 2004-2005, Glacier County appropriated $926,559 to its road department fund, $1,124 to the Cut Bank Fire Department fund, $495,242 to the ambulance fund. No specific rural fire district fund was identified in Glacier County's most recent tax levy requirements schedule.

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GLACIER COUNTY REVENUES AND EXPENDITURES		
General Revenues	**Glacier County - 2005**	**Percentages**
REVENUES		
Program Revenues		
Charges for Services	1,119,833	18.4%
Operating Grants and Contributions	431,698	7.1%
Capital Grants & Contributions	146,489	2.4%
Subtotal - Program Revenues	*1,698,020*	*27.8%*
General Revenues		
Property tax	**2,299,633**	**37.7%**
Local option tax	0	0.0%
Licenses and permits	0	0.0%
Unrestricted fed/state share revenue	1,586,111	26.0%
Unrestricted grants and contributions	0	0.0%
Unrestricted investment earnings	140,987	2.3%
Miscellaneous	112,802	1.8%
Gain on sale of property and equipment	270,412	4.4%
Transfers	-10,320	
Subtotal - General Revenues	*4,399,625*	*72.2%*
TOTAL REVENUES	**6,097,645**	**100.0%**
EXPENSES (by function)		
General Government	1,541,494	28.2%
Public Safety	**1,688,603**	**30.9%**
Public Works	1,586,030	29.1%
Public Health	188,554	3.5%
Social & Economic Services	148,487	2.7%
Culture and Recreation	239,028	4.4%
Housing & Community Development	4,000	0.1%
Debt Service Interest	35,764	0.7%
Miscellaneous	24,999	0.5%
TOTAL EXPENSES	**5,456,959**	**100.0%**

School Budget

Below is a summary of the 2005 adopted general fund budget for the Glacier County school district. The general fund budget does not include funds for transportation or retirement.

County	**2005 Adopted General Fund Budget**	**Percent of General Fund from County Property Taxes**
Glacier	14,522,823	19.1%

Source: Office of Public Instruction (OPI), Helena, Montana

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Public Services

Police Services - The Glacier County Sheriff's Office covers all areas within the County, though Cut Bank has its own Police Department as well. Glacier County Sheriff's Office has 12 officers and 7 reserves. There are 12 vehicles available for patrol. The City of Cut Bank Police Department employs 6 officers and has 5 vehicles available for patrol. The County Sheriff's office does not expect this project to cause an impact on department operations. An additional influx of temporary employees would not cause a significant increase in the department's workload. There was a road construction crew in the area last summer and that did not cause any impacts. (*Personal communication with Jared Lako, Glacier County Sheriff's Office, February 22, 2006*).

Fire Services - Cut Bank Volunteer Fire Department serves the City of Cut Bank and eastern Glacier County. The department has 25 volunteer firefighters, 2 city trucks, 3 rural trucks, and a rescue truck. The Cut Bank department also provides equipment and training to the Del Bonita Volunteer Fire Company. There are 3 rural trucks at this location, but a variable level of volunteer firefighters. The department does not expect the project to significantly impact current fire services for this area *(personal communication, Mike Lindberg, Cut Bank Firefighter, February 22, 2006).* Other departments in the county include:

- Browning Volunteer Fire Department
- Babb Volunteer Fire Department

Health and Emergency Services - Northern Rockies Medical Center is a full service medical center, with a 25-bed hospital. They provide a full service 24-hour emergency room, radiology services, and a full-service laboratory. There are 2 fulltime physicians, 1 nurse practitioner and several RN's at the hospital. There are 3 ambulances in the county. Northern Rockies Medical Center works with both Kalispell Regional Hospital and Benefis Healthcare in Great Falls for transfer of emergency patients. The center would have no problems handling any increases due to the proposed project *(personal communication, Patty McDonough, RN Clinic Director, Northern Rockies Medical Center, February 22, 2006)*

Environmental Consequences

Potential impacts from construction and operation of the proposed Project would be essentially the same for the three Project alternatives, and could include both positive and negative impacts. Positive impacts associated with the project would include economic benefit to communities and counties from employment during construction of the Project, local economic gain through goods and services provided during construction (e.g., fuel, hotel rental, meals, construction materials such as gravel and concrete), revenue received by landowners from easements located on their property, and tax revenue to counties from operation of the line. Potential negative social impacts could include strain on a local economy's ability to handle increased construction workforce. A listing of Project construction tasks and required workforce by task is provided in **Table 4.6-1**.

Due to the linear nature of the Project, and the differential in timing between the various construction tasks (See *Section 5.2 Project Design and Implementation*), it is likely that construction crews would be moving from town to town during the course of construction no one community would bear the brunt of housing and otherwise accommodating the entire workforce for an extended period. A query of hotels and motels in the Project Study Area indicated that there currently are well over 300 available beds, not including Great Falls, which itself contains

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several hundred available motel/hotel rooms. Additionally, the entire 55-person work crew would not be involved with construction concurrently, as the Project's construction would be implemented in a phased fashion. In the event a local community could not accommodate the entire workforce, crew members would likely be housed in any number of communities at one time and commute to the Project site.

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TABLE 4.6-1
SUMMARY OF CONSTRUCTION TASKS AND REQUIRED RESOURCES/EQUIPMENT
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Task	Crew Size	Equipment
Access Fencing/Reclamation	2	3/4 –ton post pounder
Framing	6	Teleking 5-ton crane
		Bobcat
		1-ton crewcab pickup
Setting	8	330 Texoma digger
		35-ton setting crane
		gravel truck
		air compressor w/ tamper
		Bobcat
		(2) 1-ton crewcab pickups
Anchoring	3	radial arm digger or retrofitted trench hoe
Material Handling	2	(2) trucks
Pole Hauling	3	pole truck
		pickup
Stringing	31	tensioneer
		puller
		30-ton crane and pickup
		soft line winder and pickup
		cat pulling soft line and pickup
		crane and pickup
		flat deck and small crane
		rider pole crew digger
		pole truck

4.6.2 Land Use

This section provides an overview level description of land use, jurisdiction, and ownership within the Project Study Area, as well as a baseline level discussion of land use and potential impacts associated with each alternative route. Data and information for this section were compiled and refined from a variety of sources and verified by ground reconnaissance during July and August 2005. Additionally, federal, state, and local regulatory personnel were contacted by telephone and/or meetings to validate existing information and to solicit additional information. A list of data sources is provided in Section 6, References.

Overview

In accordance with *Circular MFSA-2* the following specific information will be addressed in the overview section:

- Cities, towns, and unincorporated communities, and residential clusters of 5 or more dwelling units per 20 acres, based on a circle of 1,000 feet in diameter within the Project Study Area [MFSA-2, 3.4.3.a]

- Developed residential, industrial, and commercial areas adjoining cities, towns, and unincorporated communities [MFSA-2, 3.4.3.b]

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- Designated residential growth areas [MFSA-2, 3.4.3.c]
- Existing federal and state highways, and designated and existing county roads [MFSA-2, 3.4.3.d]
- Highways and roads designated as scenic routes or scenic byways by a land management agency, differentiated from non-designated highways and roads [MFSA-2, 3.4.3.d]
- Railroads and railroad rights-of-way [MFSA-2, 3.4.3.e]
- Electric transmission lines of 50 kV or greater voltage design [MFSA-2, 3.4.3.f]
- Non-timbered grassland or rangeland [MFSA-2, 3.4.3.g]
- Forested lands [MFSA-2, 3.4.3.h]
- Communication facilities, including television and radio towers, microwave facilities, cellular phone towers, and law enforcement and emergency network facilities [MFSA-2, 3.4.3.i]
- Military installations, including but not limited to, military bases, command centers, missile silos, and radar towers [MFSA-2, 3.4.3.j]
- Land areas covered by conservation easements where the presence of the facility may be incompatible with a management plan established by a state or federal agency [MFSA-2, 3.4.3.k]
- Public and private airports and airfields, and any controlled airspace associated with them, and other traffic hazard areas identified by the Montana aeronautics division and the Federal Aviation Administration [MFSA-2, 3.4.3.l]
- National trails [MFSA-2, 3.4.3.m]
- Cropland differentiated by mechanically irrigated land, other irrigated land, and dry cropland [MFSA-2, 3.4.3.n]
- Prime or unique farmland and orchards [MFSA-2 3.4.3.o]
- Mines permitted under Title 82, Chapter 4, MCA [MFSA-2, 3.4.3.p]
- Land ownership categories (federal, state, tribal, private) [MFSA-2, 3.4.4.a,b]

Table 4.6-2 depicts land ownership and jurisdiction within the Project Study Area (NRIS 2005). The majority (90%) is privately owned, with the primary remainder being owned and/or managed by state, federal, and local government agencies. A discussion of federal, state, and local land management relative to facility siting is provided below.

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TABLE 4.6-2 LAND OWNERSHIP AND JURISDICTION WITHIN PROJECT STUDY AREA MONTANA ALBERTA TIE LTD.		
Ownership	**Acreage**	**Percent**
Local Government	4,674	0.32
Private	1,296,414	89.71
Right of Way	8452	0.58
State Government	97,316	6.73
Undetermined	125	0.01
U.S. Department of Defense	1,672	0.12
U.S. Government (other)	41	0.00
USDA Forest Service	280	0.02
USDI Bureau of Land Management	21,811	1.51
USDI Fish and Wildlife Service	12,724*	0.88
Water	1,281	0.08
TOTAL	1,445,059	

∗ - Includes 5,315 ac. water.

Land use and land cover categories discussed below include Residential, Commercial/Industrial, Agricultural, and Publicly Managed land. Within each land use category, sub categories are identified and broken out as applicable for discussion and summary.

Residential

Residential land use in the Project study area includes cities, towns, colonies, residential clusters (e.g., unincorporated subdivision), and occupied dwellings (e.g., farm/ranch houses).

Cities and towns within the Project study area are Great Falls, in Cascade County; Power and Dutton, in Teton County; Conrad and Brady, in Pondera County; Shelby, Sunburst, and Sweetgrass, in Toole County; and Cut Bank, in Glacier County. Section 4.6.1 *Socioeconomics* provides a detailed description of county demographics and economics. Several Hutterite colonies are also located within the Project study area, primarily in Toole and Glacier Counties in the northern portion (**Figure D-4 North**). Other populated areas occur throughout the Project study area, in the form of developed residential clusters, most notable of which are along the North Santa Rita Road, approximately 5 miles to the north from Cut Bank, and in the north Great Falls area, between the City of Great Falls and Benton Lake National Wildlife Refuge (**Figure D-4 South**). Occupied and abandoned farmsteads also occur throughout the area, associated with agricultural production activities.

With the exception of Cascade County, no land use zoning rules currently apply in the study area and no planned subdivisions are currently slated for future construction in study area portions of Glacier, Toole, or Pondera counties (Jim Yeagley, Pers. Commun.) In the Cascade County portion of the study area, no planned subdivisions occur (Cascade County planning Department 2005) In Teton and Chouteau counties, no zoning and no planned residential development in study area. (Teton County Planning Department 2005).

Commercial/Industrial

Commercial and Industrial activities (linear/point facilities) within the Project study area include communication sites (cell towers, microwave facilities), oil and gas development, surface mines (gravel pits), airstrips (public and private), railroads, pipelines and transmission lines, roadways, and military installations (**Figures D-7 North/South**). Primary concentrations of communication

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sites occur in the vicinity of Great falls, Shelby, and Cut Bank, though individual facilities are distributed throughout the area.

Oil and gas production facilities occur primarily in the northern half of the Project study area and consist of pump (compressor) stations, collector pipelines, meter stations, industrial/processing plants, and product storage tanks, both above and below ground. The majority of the oil and gas facilities are associated with production and processing of natural gas or propane, though approximately one-third are associated with crude oil (MapSearch 2005).

MDEQ permitted open cut sand and gravel operations within the Project study area have been identified and are shown on **Figures D-7 North/South**. No MDEQ permitted hard rock mines or coal mines were identified within the study area (MDEQ 2005a). Several public and private airports/airstrips occur within the study area (**Figures D-7 North/South**). Public airports include those associated with Sunburst, Shelby, Conrad, and Dutton (NRIS 2005, MDT 2005a). Private airstrips, both paved and unpaved, are scattered throughout the Project study area and are likely used primarily for agricultural and other private application.

Agricultural

Agricultural lands in the Project Study Area include both irrigated and non-irrigated cropland. Other agricultural lands include those used for rangeland. However, these areas are difficult to separate from lands not typically grazed (non-agricultural lands such as those areas maintained as native prairie and Conservation Reserve Program (CRP) lands); therefore, for purposes of the discussion on agricultural, areas used as rangeland are included under non-agricultural lands. **Table 4.6-3** includes the relative acreage of agricultural land use by county in the Project Study Area.

TABLE 4.6-3
AGRICULTURAL LANDS BY COUNTY IN THE PROJECT STUDY AREA[1]
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

County	Irrigated Cropland	%	Non-irrigated Cropland	%	Non-Agricultural	%	Total	%
Cascade	2,312	2.3	73,839	72.4	25,844	25.3	101,995	7.4
Choteau	3041	2.3	121,226	91.9	7647	5.8	131,914	9.6
Glacier	4102	2.5	147,868	88.8	14532	8.7	166,502	12.1
Pondera	101,247	28.1	232,750	64.6	26,247	7.3	360,244	26.2
Teton	8821	4.7	162622	86.7	16025	8.5	187,468	13.6
Toole	26,154	6.1	332,931	77.7	68,998	16.1	428,083	31.1
Totals	145,677	10.6	1,071,236	77.8	159,293	11.6	1,376,206	

[1]Source: Water permits submitted to the Montana DEQ and data from computer assisted mass appraisal (CAMA). CAMA is a computer-aided analysis of data describing property characteristics that is used in establishing property values for tax assessment.

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Based on these data, most of the Project Study Area is currently cropland, with non-irrigated cropland making up the majority of agricultural lands at 77.8 percent. In addition, cropland is evenly distributed throughout the Project Study Area. However, somewhat more cropland is found in the central portion of the Project Study Area (Pondera County). Irrigated cropland is greatest in Pondera County (in the central portion of the Project Study Area) where nearly one-third of the land area is classified as irrigated. Cascade, Teton, and Chouteau Counties, in the southern portion of the Project Study Area, have relatively little irrigated cropland, at 2.3, 4.7, and 2.3 percent of the land area, respectively.

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Irrigated croplands include those croplands irrigated using flood, pivot, and wheel and hand line irrigation systems. Crops grown on irrigated fields in the region are typically hay and alfalfa. Non-irrigated crops are predominately cereal grains that have been developed to be drought resistance.

Table 4.6-4 includes an example of the relative amounts of cereal, hay, and alfalfa crops grown in Cascade County. The relative abundance of crops grown in the remaining counties in the Project Study Area is similar.

TABLE 4.6-4
IRRIGATED AND DRYLAND CROPS IN CASCADE COUNTY (2003 ACRES[1])
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Cascade County		
Crops	**Acres Planted**	**Acres Harvested**
Winter Wheat Durum Wheat Other Spring Wheat	111,000 * 29,000	105,000 * 21,300
Barley	48,000	33,000
Oats	1,300	300
Corn For Grain For Silage	* ---- ----	---- * *
Potatoes	*	*
Sugar Beets	*	*
Dry Beans 1/	*	*
All Hay Alfalfa All Other	---- ---- ----	65,000 53,000 12,000

1 – Taken from the USDA National Agriculture Statistics Service 2003 Census of Agriculture

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Publicly Managed Land

As depicted in **Table 4.6-2**, approximately 10 percent of land in the Project Study Area is publicly managed land, the majority of which falls under the jurisdiction of three public agencies, Montana DNRC, FWS, and BLM (See also **Figure D-6**). No Agricultural Experiment Stations are located within the 1-mile impact zone. [See **Figure E-6d**, Linear Point/Facility Baseline overlay].

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The State of Montana has jurisdiction over 193,790 acres within the area, the majority of these being under the DNRC as school trust parcels. FWP has authority over several wildlife management areas, fishing access sites, and other wildlife and recreation areas. Montana state trust lands are administered and managed for the benefit of the public schools and the other endowed institutions in Montana under the direction of the State Board of land Commissioners. The Real Estate Management Bureau of DNRC's Trust Land Management Division is responsible for processing applications for rights-of-way and easements across surface lands and navigable waterways administered by the state.

The primary federal agencies with lands within the Project Study Area are the BLM and FWS. BLM managed land within the Project Study Area is located in scattered parcels throughout the northern half (**Figures D-6**). Rights-of-way permits for crossing BLM managed land are managed by the BLM Lands and Realty office and approved following the appropriate Resource Management Plan compatibility assessment and National Environmental Policy Act review process.

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The FWS has management authority of the Benton Lake National Wildlife Refuge, located approximately 10 miles north of Great Falls. FWS also manages three waterfowl production areas (WPAs) in the Project Study Area, one located approximately 6 miles west of Benton Lake, one located approximately 12 miles northwest of Benton Lake, and one located approximately 15 miles northeast of Cutbank (**Figures D-4**).

The Project Study Area also contains several properties owned by the U.S. Department of Defense (DoD) (**Figures D-7**), the primary use of such properties being location of Intercontinental Ballistic Missiles and/or Missile Alert Facilities managed by Malmstrom Air Force Base 341st Space Wing, Operations Group (CAMA 2005).

Conservation Easements

Within the Project Study Area are private lands managed under conditions detailed in conservation easements held by both FWS and the USDA Farm Services Agency.

FWS holds several acres of wetland easements on private land in the northern portion of the Project Study Area (**Figures D-4**). Approval to site facilities within areas managed under wetland easement by FWS is determined by a compatibility review process, which takes into account facility location and access relative to wetland avoidance on the parcel under easement.

FSA holds Conservation Reserve Program (CRP) easements on several thousand acres within the Project Study Area (**Figures D-4**). CRP contracts between FSA and private land owners typically preclude agricultural activities (e.g., farming, grazing, haying) on acres managed under the program. Facility siting on CRP contracted land requires a compatibility review by FSA to determine a facility's potential impact to the CRP status of the affected property.

Baseline

The following discussion describes land use along the three alternative routes. **Table 4.6-5** lists the specific information addressed in the Baseline section as required by *Circular MFSA-2* (Montana DEQ 2004) and the corresponding baseline overlays. Refer to **Section 2.2** for an explanation of the information requirements that were dismissed. The information requirements fall under three basic categories including:

Land jurisdiction and ownership;
Existing land use; and
Planned land use.

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TABLE 4.6-5 LAND USE INFORMATION REQUIREMENTS AT BASELINE LEVEL MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
MFSA-2 Section	**Information Requirement**	**Baseline Overlay**	**Impact Zone (miles)**
3.4.1.c; 3.7.7.a; 3.7.10.h.ix; 3.7.12.b.ix; 3.7.15.c.viii	Federal and State Special Management Areas	Land Use/Cover	1
3.4.3.k	Conservation Easements	Land Use/Cover	1
3.4.3.p	Permitted Mines	Land Use/Cover	1
3.7.2.a; 3.7.19.a	Cities, Towns, Unincorp., Residential Clusters	Land Use/Cover	1
3.7.2.b; 3.7.19.a	Developed Residential, Commercial, Industrial Areas	Land Use/Cover	1
3.7.2.g	Non-Timbered Grassland/Rangeland	Land Use/Cover	1
3.7.2.h	Forest Lands	Land Use/Cover	1
3.7.2.j	Military Installations	Land Use and Linear Point/Facility	1
3.7.2.n	Cropland	Land Use/Cover	1
3.7.2.n	Mechanical Irrigation System Permits	Land Use/Cover	1
3.7.2.q	Platted Subdivisions	Land Use/Cover	1
3.7.2.r	Major Public Buildings	Linear Point/Facility	1
3.7.2.t	Schools; School Land	Linear Point/Facility	1
3.7.2.v; 3.7.10.h.xvi; 3.7.19.a	Individual Residences o/s 3.7.2.a	Linear Point/Facility	1
3.7.2.v	Major Farm Support Buildings	Linear Point Facility	1/2
3.7.2.w	Fence Lines > 1/4 mi; Field Boundaries	Linear Point/Facility	1

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Reviewing, refining, and updating existing data compiled the land use inventory for the Project Study Area. Following this, an investigation and interpretation of existing maps and black and white Digital Orthophoto Quadrangles (DOQs) was undertaken. Color aerial photography, taken in October 2005, was also used to identify the occurrence of land uses. The existing mapped information was subsequently verified by ground reconnaissance between June and September 2005. In addition, federal, state, and local land resource agencies and organizations were contacted by telephone, letter, or meetings to update official information and to solicit further input.

Preferred Alternative A

Land Jurisdiction and Ownership

Preferred Alternative A would roughly parallel NorthWestern Energy's (NWE's) existing 115-kV transmission line from Cut Bank to the 230-kV Substation north of Great Falls (Baseline Base Topo Maps, **Figures E-1 to E-14**). Preferred Alternative A is a total of 129.89 miles long with land jurisdiction and ownership consisting primarily of a mixture of state and local government, and private lands. **Table 4.6-6** shows land surface jurisdiction/ownership by alternative, as well as a comparison between the two northern alternative segments (Western/Eastern). Land jurisdiction and ownership is depicted in **Figures E-1a – E-14a**: Land Use/Cover Baseline.

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TABLE 4.6-6
LAND JURISDICTION/OWNERSHIP ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

	Preferred Alternative A		Alternative B		Alternative C		*Western Alt Seg.*		*Eastern Alt. Seg*	
Owner	**Miles**	**Percent**	**Miles**	**Percent**	**Miles**	**Percent**	***Miles***	***Percent***	***Miles***	***Percent***
U.S. Dept. of Defense	0.01	0.01	0.01	0.01	0.01	0.01	*0.01*	*0.1*	*0.01*	*.1*
Water	0.07	0.1	0.10	0.08	--	--	--	--	--	--
USDI Bureau of Land Management	0.29	0.2	0.15	0.12	0.35	0.25	--	--	--	--
Right of Way	0.14	0.1	0.16	0.13	0.10	0.07	--	--	--	--
State Government	10.90	8.4	6.01	4.83	5.00	3.67	*.25*	*1.4*	*2.05*	*11.1*
Local Government	--	--	--	--	0.22	0.16	--	--	--	--
Private	118.45	91.2	117.97	94.83	130.72	95.84	*18.23*	*98.5*	*16.33*	*88.7*
Total	129.89	100	124.43	100	136.49	100	*18.5*	*100*	*18.41*	*100*

Source: Montana State Library/NRIS

Two military installations are located within 1 mile of Preferred Alternative A.

Existing Land Use

Prime Farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and within allowable soil erosion tolerance, as determined by NRCS.

Unique Farmland Land is land other than prime farmland that is used for the production of specific high-value food and fiber crops, as determined by NRCS. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods.

Local or Statewide Importance is land other than prime or unique farmland that is determined to be important by the appropriate state, tribal, or unit of local government agency or agencies, with concurrence by the State Conservationist.

U.S. Congressional Public Law 95-87 (*Federal Register* January 31, 1978: Part 657) requires the NRCS to identify and map prime and unique farmland. These farmlands are protected under the Farmland Protection Act of 1981. According to a review of the important farmland mapping obtained from the NRCS, the following two types of important farmland were identified in the Project Study Area: "prime farmland if irrigated" and "farmland of statewide importance".

Prime farmland exists in the Study Area only when irrigated or where there is a permit to irrigate. Overall, there are 373,219 acres (25.8%) of prime farmland, and 515,848 acres (35.7%) of farmland of statewide importance within the project area. Preferred Alternative A crosses the least amount of prime farmland and farmland of statewide importance, while Alternative C passes through the highest percentage (See Table 4.6-7a).

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TABLE 4.6-7a
OCCURANCE OF PRIME FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES (MILES)
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover	Preferred A	Alternative B	Alternative C	*Western Alt. Segment*	*Eastern Alt. Segment*
Prime Farmland (if irrigated)	27.66 (21.3%)	32.99 (26.5%)	43.86 (32.1%)	*0.67 (3.6%)*	*0.58 (3.2%)*
Farmland of Statewide Importance	42.53 (32.7%)	43.83 (35.2%)	46.64 (34.2%)	*4.11 (22.2%)*	*7.09 (38.5%)*
Other	59.70 (46.0%)	47.61 (38.3%)	45.99 (33.7%)	*13.72 (74.1%)*	*10.74 (58.3%)*
Total	129.89	124.43	136.49	*18.50*	*18.41*

Based on analysis of NRCS Soil Data

In general, the land along Preferred Alternative A appears to be dominated by agriculture (90%) interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands. With the exception of grazing land near the Marias and Teton rivers, coulees and drainages, this route is estimated to primarily be composed of non-irrigated farmland and to a lesser extent irrigated farmland (**Table 4.6-7b**). Non-irrigated cropland and irrigated cropland is the principal land use along Preferred Alternative A, although livestock grazing and CRP are present as well.

TABLE 4.6-7b
LINEAR MILES OF FARMLAND AND NON-FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover[1]	Preferred A	Alternative B	Alternative C	*Western Alt. Segment*	*Eastern Alt. Segment*
Sprinkler-Irrigated Farmland	16.28 (12.5%)	15.73 (12.6%)	12.63 (9.3%)	*0.00 (0%)*	*1.00 (5.4%)*
Other-Irrigated Farmland	0.91 (0.7%)	1.72 (1.4%)	4.16 (3%)	*0.00 (0.0%)*	*0.25 (1.4%)*
Non-Irrigated Farmland	99.86 (76.9%)	97.61 (78.4)	111.22 (81.5%)	*18.23 (98.5%)*	*15.08 (81.9%)*
Non-Farmland	12.84 (9.9%)	9.37 (7.6%)	8.48 (6.2%)	*0.27 (1.5%)*	*2.08 (11.3%)*
Total	129.89	124.43	136.49	*18.50*	*18.41*

[1]Source: Water permits submitted to the Montana DEQ and data from computer assisted mass appraisal (CAMA). CAMA is a computer-aided analysis of data describing property characteristics that is used in establishing property values for tax assessment.

Among the crops grown on irrigated land, the most common are alfalfa and small grains such as wheat and barley. Non-irrigated cropland (dryland agriculture) comprises the bulk of cultivated land along Preferred Alternative A and is generally found on the adjacent uplands. Principal crops include cereal grains developed to be drought resistant. Not all the acres devoted to dryland agriculture are planted each year. Much of the land is cultivated under an alternate crop-fallow system.

GAP analysis data (**Table 4.6-7c**) predict that non-timbered grassland or rangeland comprises approximately 41 percent of Preferred Alternative A. Based on field investigations and further ortho-photo review, non-timbered grassland and rangeland is predominantly located near the Marias and Teton rivers, and along coulees and drainages. As observed during field investigations, forested lands along Preferred Alternative A occur predominantly as cottonwood gallery forest along the Marias and Teton Rivers and comprise less than 1 percent of Preferred Alternative A.

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LINEAR MILES OF FARMLAND AND NON-FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES¶
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TABLE 4.6-7c
LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover Type[1]	Preferred Alternative A		Alternative B		Alternative C	
	Length (miles):	Percent:	Length (miles):	Percent:	Length (miles):	Percent:
Low/Moderate Cover Grasslands	42.24	32.5	40.32	32.4	39.68	29.1
Agricultural Lands – Irrigated[2]	39.37	30.3	38.21	30.7	40.17	29.4
Agricultural Lands - Dry[2]	33.67	25.9	35.71	28.7	40.47	29.7
Altered Herbaceous	5.17	4.0	2.45	2	6.54	4.8
Moderate/High Cover Grasslands	1.74	1.3	1.03	0.8	1.74	1.3
Very Low Cover Grasslands	2.58	2.0	2.55	2	2.43	1.8
Rock	0.61	0.5	0.9	0.7	0.9	0.7
Graminoid and Forb Riparian	1.30	1.0	1.28	1	1.32	1
Ponderosa Pine[3]	.95	0.7	.59	0.5	1	0.7
Shrub Riparian	0.31	0.2	.11	0.1	0.22	0.2
Rocky Mountain Juniper	0.0	0.0	0.2	0.2	0	0.0
Mixed Mesic Shrubs	0.44	0.3	0.29	0.2	0.75	0.6
Mixed Barren Sites	0.44	0.3	0.21	0.2	0.06	0.0
Mixed Xeric Forest	0.17	0.1	0.17	0.1	0.17	0.1
Mixed Broadleaf Forest	0.0	0.0	0.04	0.0	0.26	0.2
Conifer Riparian[3]	0.82	.06	0.38	0.3	0.47	0.3
Salt-Desert Shrub/Dry Salt Flat	0.07	0.1	0.0	0.0	0.17	0.1
Water	0.0	0.0	0.0	0.0	0.04	0.0
Broadleaf Riparian	0.01	0.0	0.0	0.0	0.1	0.1

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

Table 4.6-7d shows a direct comparison between the 18.5 mile Western Alternative Segment and the 18.41 mile Eastern Alternative Segment (northern most segment of the Preferred Alternative A). The Western Alternative Segment has comparatively more grasslands, than the Eastern Alternative Segment.

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TABLE 4.6-8¶
LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE¶
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TABLE 4.6-7d LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG THE WESTERN & EASTERN SEGMENT ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT				
Land Cover Type[1]	**Eastern Alternative**		**Western Alternative**	
	Length (miles):	**Percent:**	**Length (miles):**	**Percent:**
Low/Moderate Cover Grasslands	8.56	46.5	10.52	56.9
Agricultural Lands – Dry[2]	5.25	28.5	3.47	18.8
Agricultural Lands - Irrigated[2]	3.21	17.4	1.79	9.7
Altered Herbaceous	--	--	0.48	2.6
Very Low Cover Grasslands	0.22	1.2	0.45	2.4
Moderate/High Cover Grasslands	0.42	2.3	1.18	6.4
Graminoid and Forb Riparian	0.53	2.9	0.15	0.8
Ponderosa Pine[3]	--	--	--	--
Conifer Riparian[3]	--	--	--	--
Rock	--	--	0.28	1.5
Mixed Barren Sites	0.14	0.8	--	--
Mixed Mesic Shrubs	--	--	0.18	0.9
Shrub Riparian	0.07	0.4	--	--
Mixed Xeric Forest	--	--	--	--
Salt-Desert Shrub/Dry Salt Flat	--	--	--	--
Broadleaf Riparian	--	--	--	--

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

Additional Analysis: Based on additional orthophoto analysis, the prime farmland data (Table 4.6-7a), the CAMA data (shown in Table 4.6-7b) and the GAP analysis data (shown in Table 4.6-7c) over-estimate, in particular, the mileage of irrigated farmland along each route. More precise orthophoto analysis of recent aerial photography determined that Preferred Route A obviously crosses only .11 miles of irrigated farmland (0.1 percent) instead of the CAMA estimate of 13 percent, and the GAP prediction of 28 percent. This more accurate, photo-based percentage of irrigated cropland is consistent with MATL's intent to avoid irrigated cropland where possible.

The orthophoto analysis also identified that Preferred Route A crosses 78.43 miles or (60.4 percent) of dry farmland. Preferred Route A also crosses approximately 49.5 miles (38 percent) of open/grassland, 1.75 miles (1.3 percent) of riparian areas and 0.15 miles (.1 percent) of water/wetlands. In general this analysis concluded that more open/grassland and less irrigated and dry farmland is crossed, under all alternatives, than what the CAMA data estimated in Table 4.6-7b. Complete orthophoto analysis results for all route options are provided in Table 4.6-8.

Deleted: [1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types. ¶
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana. ¶
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.¶

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TABLE 4.6-8 ORTHO-PHOTO ANALYSIS OF LINEAR MILES OF LAND COVER TYPES ALONG TRANSMISSION LINE ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT					
Land Cover[1]	**Preferred A**	**Alternative B**	**Alternative C**	***Western Alt. Segment***	***Eastern Alt. Segment***
Dry Farmland	78.43 (60.4%)	88.02 (70.7%)	93.43 (68.5%)	*10.21 (55.2%)*	*11.69 (63.5%)*
Irrigated Farmland	0.0 (0.0%)	1.60 (1.3%)	2.00 (1.5%)	*0.0 (0.0%)*	*0.0 (0.0%)*
Wetland/Water	0.15 (.1%)	0.26 (0.2%)	0.17 (0.1%)	*0.04 (0.2%)*	*0.0 (0.0%)*
Open/Grassland	49.56 (38.2%)	32.48 (26.1%)	38.66 (28.3%)	*8.14 (44%)*	*6.42 (34.9%)*
Riparian	1.75 (1.3%)	1.98 (1.6%)	1.96 (1.4%)	*0.1 (0.5)*	*0.3 (1.6%)*
Forest	0.00 (0.0%)	0.09 (0.1%)	0.27 (0.2%)	*0.0 (0.0%)*	*0.0 (0.0%)*
Total	129.89	124.43	136.49	*18.50*	*18.41*

Based on GIS orthophoto analysis, March and August 2006

In terms of comparisons between the two northern most segments, the 18.5 mile Western Alternative Segment crosses 55 percent dry farmland and 44 percent open/grassland, and the 18.41 mile Eastern Alternative Segment (segment of the Preferred A route) crosses 63.5 percent dry farmland, and 35 percent open/grassland.

Linear miles of lands under federal/state special management and those lands currently under federal or state conservation easements (wetland easements, CRP easements, Montana Fish, Wildlife & Parks easements) are depicted in **Table 4.6-9** for each alternative route.

TABLE 4.6-9 LINEAR MILES OF FEDERAL/STATE SPECIAL MANAGEMENT AREAS AND CONSERVATION EASEMENTS ALONG EACH ALTERNATIVE					
	Preferred Alternative A	**Alternative B**	**Alternative C**	***Western Alternative Segment***	***Eastern Alternative Segment***
State Land – Great Falls Shooting Sports Complex	.51 miles	.76 miles	.76 miles	--	--
Montana State Trust Land (DNRC)	10.63 miles	5.27 miles	4.30 miles	*27 miles*	*2.1 miles*
Conservation Easements[1] (Total)	23.61 miles (CRP) 0.12 miles (MT FWP) (Borders 1.76 miles of USFWS)	3.76 miles (Wetland) 15.31 miles (CRP) .15 miles (MT FWP)	~~2.0 miles~~ (Wetland) ~~22.70 (CRP)~~ .15 miles (MT FWP)	*3.0 miles (CRP) 1.37 miles (USFWS)*	*2.51 miles (CRP) Borders 1.76 miles of USFWS*

1. Sources: USFWS wetland program, Benton Lake NWR; FSA CRP data by county, MT Fish, Wildlife & Parks (MT FWP).

Preferred Alternative A comes within 1 mile of one Hutterite Colony (Glacier). **Table 4.6-10** illustrates the developed residential, commercial, and industrial areas that are within 1 mile of each of the alternatives, as well as a direct comparison between the two northern alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative).

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TABLE 4.6-10 DEVELOPED RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL AREAS WITHIN 1 MILE OF EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT					
	Preferred Alternative A	**Alternative B**	**Alternative C**	***Western Alt. Segment***	***Eastern Alt. Segment***
Developed Residential[1]	101	170	160	*4*	*1*
Developed Commercial[2]	24	26	23	*1*	*0*
Developed Industrial[3]	139	159	149	*8*	*9*

[1] Source: CAMA and field surveys
[2] Source: CAMA and field surveys
[3] Source: CAMA and field surveys

The proposed route would come within 1 mile of 1,906 water permits submitted to the Montana DEQ. The permits indicate the ability to irrigate land along the route.

With the exception of Bootlegger Subdivision north of Great Falls, residential development along Preferred Alternative A is for the most part dispersed and rural in character. One school was identified within 1 mile of Preferred Alternative A.

Table 4.6-11 illustrates the number of schools, school land, major public buildings, major farm support buildings, and fence lines greater than ¼ mile that are within 1 mile of the alternatives, and also provides a direct comparison between the Western and Eastern Alternative Segments.

TABLE 4.6-11 MAJOR PUBLIC BUILDINGS, FARM SUPPORT BUILDINGS, AND FENCE LINES WITHIN 1 MILE OF EACH OF THE ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT					
Data	**Preferred Alternative A**	**Alternative B**	**Alternative C**	***Western Alt. Segment***	***Eastern Alt. Segment***
Schools[1]	1	4	2	*0*	*1*
School-owned property[2]	2 parcels	3 parcels	3 parcels	*0*	*0*
Major Public Buildings[3]	3	4	4	*0*	*0*
Major Farm Support Buildings (within ½ mile)[3]	100	122	72	*3*	*2*
Fence Lines Greater than ¼ mile long[3]	69	85	46	*8*	*2*

[1]Source: Montana Department of Administration (MTDA) and field surveys
[2]Source: CAMA
[3]Source: Field surveys

Eight permitted mines are located within 1 mile of Preferred Alternative A.

Planned Land Use

Preferred Alternative A crosses through Glacier, Pondera, Teton, Toole, and Cascade counties. All of these counties have adopted a comprehensive land use plan. Cascade County is the only county within the Project Study Area with zoning regulations.

The only platted subdivision within 1 mile of Preferred Alternative A is located north of Great Falls and is known as Bootlegger Subdivision. Preferred Alternative A passes through .42 miles of Bootlegger Subdivision.

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Alternative B

Land Jurisdiction and Ownership

As previously described, Alternative B would follow a similar path as Preferred Alternative A. Alternative B is a total of 124.43 miles long with land jurisdiction and ownership consisting primarily of a mixture of state and local government, and private lands, with some BLM land. Table 4.6.2-5 shows land surface jurisdiction/ownership by alternative. Land jurisdiction and ownership is depicted in **Figures E-1a – E-14a**: Land Use/Cover Baseline.

Four missile silos are located within 1 mile of Alternative B.

Existing Land Use

The land along Alternative B is dominated by agriculture (92.4%) interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands. With the exception of grazing lands, coulees, drainages, and the Marias and Teton River crossings, this route is primarily composed of non-irrigated farmland and irrigated farmland (**Tables 4.6-7a&b**). Non-irrigated cropland and irrigated cropland is the principal land use along Alternative B, although livestock grazing and CRP are present as well.

Among the crops grown on irrigated land, the most common are alfalfa and small grains such as wheat and barley. Non-irrigated cropland (dryland agriculture) comprises the bulk of cultivated land along Alternative B and is generally found on the adjacent uplands. Principal crops include cereal developed to be drought-resistant. Not all the acres devoted to dryland agriculture are planted each year. Much of the land is cultivated under an alternate crop-fallow system.

GAP analysis data predicts that non-timbered grassland or rangeland comprises approximately 35 percent of Alternative B, which based on field investigations, is predominantly located near the Marias and Teton rivers. As observed during field investigations, forested lands along Alternative B occur predominantly as cottonwood gallery forest along the Marias and Teton rivers and comprise less than 1 percent of Alternative B (**Table 4.6-7c; "**mixed broadleaf forest" and "broadleaf riparian").

Alternative B has 6.03 linear miles of federal/state special management areas and 19.22 linear miles of conservation easements (**Table 4.6-9**).

Alternative B comes within 1 mile of the corporate limits of Conrad and Great Falls, and one Hutterite Colony (Hillside). **Table 4.6-10** illustrates the developed residential, commercial, and industrial areas that are within 1 mile of Alternative B.

The proposed route would come within 1 mile of 2,863 water permits submitted to the Montana DEQ. The permits indicate the ability to irrigate land along the route.

With the exception of Bootlegger Subdivision north of Great Falls, residential development along Alternative B is for the most part dispersed and rural in character. Four schools were identified within 1 mile of Alternative B.

Table 4.6-11 illustrates the number of schools, school land, major public buildings, major farm support buildings, and fence lines greater than ¼ mile that are within 1 mile of Alternative B.
Seven permitted mines are located within 1 mile of Alternative B.

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Planned Land Use

Alternative B crosses through Glacier, Pondera, Teton, Toole, and Cascade counties. All of these counties have adopted a county comprehensive plan. However, Cascade County is the only county within the Project Study Area with zoning regulations.

The only platted subdivision within 1 mile of Alternative B is located north of Great Falls and is known as Bootlegger Subdivision. Alternative B passes along 0.48 linear miles of Bootlegger Subdivision.

Alternative C

Land Jurisdiction and Ownership

Alternative C is a total of 136.49 miles long with land jurisdiction and ownership consisting primarily of a mixture of state and local government, and private lands, with some BLM land. **Table 4.6-6** shows land surface jurisdiction/ownership by alternative. Land jurisdiction and ownership is depicted in **Figures E-1a – E-14a**: Land Use/Cover Baseline.

Three military installations are located within 1 mile of Alternative C.

Existing Land Use

Alternative C is dominated by agriculture (94%) interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands. With the exception of grazing land near Willow Rounds, coulees, drainages, and the Marias River and Teton River crossings, this route is primarily composed of non-irrigated farmland and irrigated farmland (**Tables 4.6-7a&b**). Non-irrigated cropland and irrigated cropland is the principal land use along Alternative C, although livestock grazing and CRP are present as well.

Among the crops grown on irrigated land, the most common are alfalfa and small grains such as wheat and barley. Other crops grown include grass and grain hays, silage, safflower, corn, and livestock pasture. Non-irrigated cropland (dryland agriculture) comprises the bulk of cultivated land along Alternative C and is generally found on the adjacent uplands. Principal crops include wheat, barley, oats and grain hay. Not all the acres devoted to dryland agriculture are planted each year as much of the land is cultivated under an alternate crop-fallow system.

GAP analysis data predicts that non-timbered grassland or rangeland comprises approximately 31 percent of Alternative C, which based on field investigations, is predominantly located near the Marias and Teton rivers, and coulees and drainages. As observed during field investigations, forested lands along Alternative C occur predominantly as cottonwood gallery forest along the Marias and Teton rivers and comprise less than 1 percent of Alternative C (**Table 4.6-7c**).

Alternative C has 5.06 linear miles of federal/state special management areas and 24.85 linear miles of conservation easements (**Table 4.6-9**).

Alternative C comes within 1 mile of the corporate limits of three municipalities (Cutbank, Great Falls and Woods Crossing), and one Hutterite Colony (Glacier). **Table 4.6-10** illustrates the developed residential, commercial, and industrial areas that are within 1 mile of each of the alternatives.

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The proposed route would come within 1 mile of 3,254 water permits submitted to the Montana DEQ. The permits indicate the ability to irrigate land along the route.

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With the exception of Bootlegger Subdivision north of Great Falls, residential development along Alternative C is for the most part dispersed and rural in character. Two schools were identified within 1 mile of Alternative C.

Table 4.6-11 illustrates the number of schools, school land, major public buildings, major farm support buildings, and fence lines greater than ¼ mile that are within 1 mile of Alternative C. Three permitted mines are located within 1 mile of Alternative C.

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Planned Land Use

Alternative C crosses through Glacier, Pondera, Teton, Toole, and Cascade counties. All of these counties have adopted a county comprehensive plan. Cascade County is the only county within the Project Study Area with zoning regulations.

Alternative C also comes within 1 mile of Bootlegger Subdivision and passes along 0.48 linear miles of Bootlegger Subdivision.

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Western/Eastern Alternative Segments Comparison

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There are no mines within a mile radius of Western Alternative Segment, one water permit within a mile radius, no missile silos within a mile radius, and no schools within a mile radius. There are no subdivisions within a mile radius but, the segment does come within a mile of the Horizon Hutterite Colony.

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There are no mines within a mile radius of the Eastern alternative Segment, 14 water permits within a mile radius, no missile silos within a mile radius, and one school within a mile radius. There are no subdivisions within a mile radius of the Eastern Segment, however it does come within a mile of the Glacier Hutterite Colony.

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Environmental Consequences

All three alternatives traverse a similar rural landscape and there are no substantive differences among the amount of farmland, grassland, forestland, and developed residential, commercial, and industrial areas along the three alternatives. Consequently, differences in land use among the three alternatives are not substantively different.

Due to the lack of difference among the three alternative routes relative to land use, potential impacts are discussed in aggregate for the entire Project Study Area and not by individual alternatives.

Land use impacts pertain to physical or operational effects of the proposed transmission line on existing and future land use. Significant impacts for this project are assessed relative to four criteria:

Criteria 1: displace, alter, or otherwise physically affect any existing, developing or planned agricultural land use within one mile of the alternatives;
Criteria 2: displace, alter, or otherwise physically affect any existing, developing or planned residential land use within one mile of the alternatives;

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Criteria 3: displace, alter, or otherwise physically affect any existing, developing, or planned commercial land use within one mile of the alternatives;
Criteria 4: displace, alter, or otherwise physically affect any existing, developing, or planned industrial land use within one mile of the alternatives;
Criteria 5: displace, alter, or otherwise physically affect any existing, developing, or planned mining land use within one mile of the alternatives;
Criteria 6: displace, alter, or otherwise physically affect any existing, developing, or planned public land use within one mile of the alternatives.

Criteria 1: A significant impact could result from the uncompensated loss of crop production or foreclosure of reasonably foreseeable future land use. In the Project Study Area, impacts on land use would primarily be related to agricultural practices. The routes were delineated in such a way as to minimize impacts to irrigated croplands, and avoid all current occurrences of pivot irrigation systems. This was verified with orthophoto analysis (**Table 4.6-8**)

As far as natural vegetation along the routes (non-farmland), GAP predicts that an average of 30-34 percent is very low to high cover grasslands and less than 1 percent is riparian forest (**Table 4.6-7c**). According to orthophoto analysis (**Table 4.6-8**), open land/grass land comprise between 26 to 38 percent of each alternative's mileage (Alternative A having the most), and riparian areas comprise between 1.3 to 1.6 percent of each alternative's mileage. Potential impacts to grasslands and riparian vegetation from construction, operation, and maintenance of the proposed transmission line would be mitigated or avoided using the measures summarized in **Section 5.3**. Potential impacts on agriculture would be both short and long-term.

Short-term impacts associated with the three alternatives would include:

- Temporary loss of cropland in work areas;
- Restrictions on existing irrigation operations during construction;
- Reduced crop yields due to soil compaction; and
- Increased potential for introduction of invasive weeds.

Long-term impacts could include:

- Modification of farming operations near and around structures;
- Loss of cropland under and around structures;
- Reduced crop yield due to invasive weeds and soil compaction resulting from farm equipment maneuvering around structures;
- Modification of routes of aerial applied herbicides and fertilizers; and
- Alteration of existing or proposed irrigation systems.

Short-term disruption of farming activities along the right-of-way could occur locally during construction. Locating structures in previously disturbed areas, or in areas where agricultural practices have already been modified would minimize long-term impacts in the right-of-way. Environmental protection measures listed in *Section 5.3* would be implemented to reduce potential impacts on land use due to erosion, soil compaction, and noxious weeds.

Applying environmental protection measures discussed in *Section 5.3* would minimize short-term impacts on agriculture along the transmission line route. Selecting structure locations with consideration to land use priorities identified by the landowners would minimize long-term impacts along the route. Right-of-way agreements would be negotiated with landowners in the route with the knowledge that land use would be affected and any proposed irrigation systems would need to be redesigned or relocated.

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Due to avoidance of land use disruption, environmental protection measures identified in *Section 5.3*, and provisions of right-of-way agreements negotiated with landowners, the proposed transmission line project would not result in the uncompensated loss of crop production or foreclosure of future land use. As a result, no significant impacts on land use would occur.

Criteria 2: To the extent feasible, Project facilities, including poles and access roads would be installed along the edges of borders of property. Consultation with the landowner or land management agency will be conducted to identify facility locations that create the least potential for impact to property and its uses. During the right-of-way acquisition process, coordination with each affected landowner will be conducted in order to develop an alignment and specific tower locations, to provide clear information about the right-of-way acquisition process compensation and construction and maintenance activities, and to understand landowner plans for use of the transmission corridor area in order to minimize the impact of tower and right-of-way location.

Criteria 3, 4, 5, and 6: Coordination with landowners, lessees, and companies during final transmission line design will be conducted, to the extent feasible, to align the transmission line, so as to minimize potential land use conflicts with oil and gas leases, permitted sand and gravel operations, natural gas pipelines, proposed water pipelines and maximize the distance between the transmission line and agricultural operations, planned developments, canals, apiaries, and other commercial and industrial land uses located within, adjacent to, and near the right-of-way.

4.6.3 Utilities and Transportation

Railroad facilities in the Project Study Area include track, right-of-way, and associated ancillary operations facilities (e.g., loadouts, sidings, and terminals). The rail system is owned and operated by the Burlington Northern and Santa Fe Railroad (BNSF). A north to south single-track system runs from Great Falls through Power to Sweet Grass, with side tracks branching off to both Chouteau and Valier. The east to west rail system roughly parallels U.S. Highway 2, and runs through the Project Study Area from Shelby to Cut Bank, intersecting with the north to south line at Shelby (**Figures D-7**).

Transmission lines with 50-kv or greater capacity currently operating in the Project Study Area include a 115-kV line owned and operated by Northwestern Energy (NWE), a 230-kV line owned and operated by the Western Area Power Administration (Western), and a 115-kV line running from Shelby to Cut Bank that is owned and operated by Marias River Electric Cooperative Inc. (MDEQ 2005b) (**Figures D-7**).

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A variety of pipelines between 8 and 20 inches in diameter occur within or traverse the Project Study Area including gathering system main lines and transmission/trunk lines. These pipelines are used to transport either crude oil or natural gas. Owner/operators of these systems are Encana Corporation, Cenex Harvest States Cooperatives, and ConocoPhillips (MapSearch 2005). With the exception of Encana Corporation's 16 inch natural gas pipeline, which runs east to west, primary routes for the main transmission/trunk lines generally run south to north and are located in the western portion of the Project Study Area (**Figures D-7**).

Telephone companies (Northern Telephone Cooperative, 3Rivers, QWEST, etc.) do not have detailed, publicly accessible databases of buried telephone lines that can be accessed for this application process. Given that this information is not readily available, MATL will instead coordinate with telephone companies before final siting occurs to request the companies flag

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any underground lines near the proposed line. This will ensure the final siting takes into consideration any known buried lines and MATL can make any necessary adjustments for avoidance or mitigation purposes at that time.

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Several state and federal highways and designated and existing county roads traverse the Project Study Area (**Figures D-7**). Interstate Highway 15 (I-15) runs south to north, generally through the central and eastern portion, entering the Project Study Area near Great Falls to the south and exiting at the Port of Sweetgrass at the U.S./Canadian border to the north. Approximately 112 miles of the I-15 corridor runs through the Project Study Area. U.S. Highway 2 traverses the Project Study Area from east to west for approximately 28 miles in the northern portion, with termini just east of Shelby and at Cut Bank. Approximately 6 miles of U.S. Highway 87 crosses the southwestern corner of the Project Study Area immediately northeast of Great Falls. State Highways within the Project Study Area include approximately 9 miles of Montana 44, an east to west route in Pondera County; and approximately 200 miles of Secondary system roads (**Figures D-7**) (MDT 2005b).

Baseline

The following discussion describes utilities and transportation along the three alternative routes, as well as a direct comparison between the two northern alternative segments: the Western Alternative Segment, and the Eastern Alternative Segment (which is part of the Preferred Alternative). **Table 4.6-12** lists the specific information addressed in the Baseline section as required by Circular MFSA-2 (Montana DEQ 2004) and the corresponding baseline overlays. Refer to Section 2.2 for an explanation of the information requirements that were dismissed.

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TABLE 4.6-12
UTILITIES AND TRANSPORATION INFORMATION REQUIREMENTS AT BASELINE LEVEL
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

MFSA-2 Section	Information Requirement	Baseline Overlay	Impact Zone (miles)
3.7.2.d	Federal, State, and County Hwy's; Scenic Routes	Linear Point Facility	1
3.7.2.e; 3.7.19.b	Railroads and Railroad Right-of-Ways	Linear Point Facility	1
3.7.2.f	Transmission Lines > 50kV	Linear Point Facility	1
3.7.2.i	Point Communication Facilities	Linear Point Facility	1
3.7.2.l	Airfield; Airspace; Hazards	Linear Point Facility	1
3.7.2.s	Pipelines greater than 8 in	Linear Point Facility	1

Information used in this section includes traffic data obtained from the Montana Department of Transportation (MDOT). Color aerial photography, taken in October 2005, was also used to identify the occurrence of land uses. Prior to the aerial photography, existing mapped information was verified by ground reconnaissance between June and September 2005. Additional information sources included county road maps.

Preferred Alternative A - Transportation

The roadway network that could potentially be affected by Preferred Alternative A includes highways and roads that are crossed or are parallel to the proposed transmission line. Paved and improved roadways crossed or paralleled by Preferred Alternative A are presented in **Table 4.6-13**.

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TABLE 4.6-13 U.S., STATE AND COUNTY ROADWAYS CROSSED OR PARALLELED BY ALTERNATIVE A MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Roadway	**Jurisdiction**
Santa Rita North Road (Hwy 214) - state and secondary highway	Montana Department of Transportation and Glacier County
Kevin Highway (Hwy 215) - state and secondary highway	Montana Department of Transportation
U.S. Highway 2	Montana Department of Transportation
Valier Highway (Hwy 44) - state and secondary highway	Montana Department of Transportation
Manson Road (Hwy 534) – state and secondary highway	Montana Department of Transportation
Conrad – Pendroy Road (Hwy 219) – state and secondary highway	Montana Department of Transportation
Interstate 15	Montana Department of Transportation
Brady East Road (Hwy 365) – state and secondary highway	Montana Department of Transportation
16th Road NE (Hwy 379) state and secondary highway	Montana Department of Transportation
Bootlegger Trail (Hwy 225) - state and secondary highway	Montana Department of Transportation
U.S. Highway 87 - Havre Highway	Montana Department of Transportation

Preferred Alternative A crosses or parallels 120 local roads or city streets; and crosses the Burlington Northern Santa Fe (BNSF) Railway Railroad five times. Three unpaved private airstrips are within 1 mile of Preferred Alternative A.

Preferred Alternative A - Utilities

The route crosses the NorthWestern Energy 115-kV transmission line in 6 places and parallels it for 18 miles. It also crosses the Western Area Power Administration (WAPA) 230-kV transmission line once.

Sixteen point communication facilities are within 1-mile of Preferred Alternative A. And, based on publicly available shapefiles from Montana DEQ, the route crosses the 8-inch Continental oil pipeline 5 times, the Continental 12-inch oil pipeline 3 times, and the 16-inch Cenex oil pipeline once.

Alternative B – Transportation

The roadway network that could potentially be affected by Alternative B includes highways and roads that are crossed or are parallel to the proposed transmission line. Paved and improved roadways crossed or paralleled by Alternative B are presented in **Table 4.6-14**.

TABLE 4.6-14 U.S. AND STATE ROADWAYS CROSSED OR PARALLELED BY ALTERNATIVE B MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Roadway	**Jurisdiction**
Santa Rita North Road (Hwy 214) - state and secondary highway	Montana Department of Transportation and Glacier County
Kevin Highway (Hwy 215) - state and secondary highway	Montana Department of Transportation
U.S. Highway 2	Montana Department of Transportation
Valier Highway (Hwy 44) - state and secondary highway	Montana Department of Transportation
Dupuyer Road (Hwy 534) - - secondary highway	Pondera County (maintained)
Interstate 15 Business Loop	Montana Department of Transportation
Interstate 15	Montana Department of Transportation
Brady East Road (Hwy 365) – state and secondary highway	Montana Department of Transportation
Hwy 379 (state and secondary highway)	Montana Department of Transportation
Bootlegger Trail (Hwy 225) - state and secondary highway	Montana Department of Transportation
U.S. Highway 87 - Havre Highway	Montana Department of Transportation

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Alternative B crosses or parallels 121 local roads or city streets; and crosses the Burlington Northern Santa Fe (BNSF) Railway Railroad five times. The Conrad Airport and four unpaved private airstrips are within 1 mile of Alternative B.

Alternative B – Utilities

The route crosses the NorthWestern Energy 115-kV transmission line in three places and parallels it for the majority of its length. It also crosses the WAPA 230-kV transmission line once. Fourteen point communication facilities are within 1-mile of Alternative B. And, based on publicly available shapefiles from Montana DEQ, the route crosses the 8-inch Continental oil pipeline nine times and the 16-inch Cenex oil pipeline once.

Alternative C – Transportation

The roadway network that could potentially be affected by Alternative C includes highways and roads that are crossed or are parallel to the proposed transmission line. Paved and improved roadways crossed or paralleled by Alternative C are presented in **Table 4.6-15**.

TABLE 4.6-15
U.S. AND STATE ROADWAYS CROSSED OR PARALLELED BY ALTERNATIVE C
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Roadway	Jurisdiction
Santa Rita North Road (Hwy 214) - state and secondary highway	Montana Department of Transportation and Glacier County
Kevin Highway (Hwy 215) - state and secondary highway	Montana Department of Transportation
U.S. Highway 2	Montana Department of Transportation
Valier Highway (Hwy 44) - state and secondary highway	Montana Department of Transportation
Interstate 15	Montana Department of Transportation
Sollid Road (Hwy 218) – state and secondary highway	Montana Department of Transportation
Brady East Road (Hwy 365) - state and secondary highway	Montana Department of Transportation
Bootlegger Trail (Hwy 225) - state and secondary highway	Montana Department of Transportation
U.S. Highway 87 - Havre Highway	Montana Department of Transportation

Alternative C crosses or parallels 110 local roads or city streets; and crosses the Burlington Northern Santa Fe (BNSF) Railway Railroad two times. Two unpaved private airstrips are within 1 mile of Alternative C.

Alternative C – Utilities

The route crosses the NorthWestern Energy 115-kV transmission line in 3 places and parallels one segment at the end of the route north of Great Falls. It also crosses the WAPA 230-kV transmission line once.

Nineteen point communication facilities are within 1 mile of Alternative C. And, based on publicly available shapefiles from Montana DEQ, the route crosses the 8-inch Continental oil pipeline six times and the 16-inch Cenex oil pipeline once.

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Western/Eastern Alternative Segment Comparison

The Western Alternative Segment crosses Santa Rita North Road (Hwy 214) once, and crosses or parallels 11 local roads or city streets. The Western Alternative Segment does not cross any railroad lines. There is one unpaved private airstrip within a mile of the Western Alternative. This segment does not cross or parallel any transmission lines within the feature dataset. There are 4 point communication facilities within 1 mile of the Western Alternative Segment. And, based on publicly available shapefiles from Montana DEQ, the route crosses the 16-inch Cenex oil pipeline once.

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The Eastern Alternative Segment (part of the Preferred A Alternative) also crosses Santa Rita North Road (Hwy 214) once, and crosses or parallels 11 local roads and city streets. The Eastern Alternative Segment does not cross any railroad line. There is one unpaved private airstrip within 1 mile of Eastern Alternative, and the segment does not cross or parallel any transmission lines within the feature dataset. There is one point communication facility within 1 mile of Eastern Alternative Segment. And, based on publicly available shapefiles from Montana DEQ, the route crosses the Cenex 16-inch oil pipeline once.

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Environmental Consequences

No compatibility or interference problems will occur given all communications facilities will be flagged (to be avoided) ahead of time. Per consultation with Northern Telephone Cooperative (Terry Kimmet, Plant Supervisor; 5/2/06), the company is in the process of flagging all underground cable within their service area for MATL to ensure the transmission line is sited properly. Flagging of existing lines is required by law and is done free of charge by Northern Telephone. Mr. Kimmet indicated that they have hard copy maps in their office of existing lines, but nothing digitally. Given that flagging lines is required by law, this process will also be required of other carriers including 3Rivers and QWEST.

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A transmission line is inherently more likely to affect transportation facilities (roadways) during construction than during operation, because there is typically only a minimal amount of surface activity required to operate a transmission line after construction is completed. The following section presents potential impacts associated with the proposed transmission line, followed by a description of proposed measures or practices that would be used to alleviate the adverse impacts.

Direct and indirect impacts could include increase in traffic, detours along some roads, and disrupted access to driveways. Construction of the transmission line is not expected to cause major traffic delays or road closures. Minor traffic delays or interference with the highway system would most likely result from construction activities. Transmission line construction techniques should not require temporary closure of main highways. Users of smaller roads may experience minor delays. MATL would work closely with MDT and the counties so that crossings are properly posted and detours provided where necessary.

Impacts associated with the Project would be short term and related to the movement of personnel and equipment during construction of the transmission line. Traffic associated with operations would be a limited number of daily vehicle trips during routine inspection and maintenance activities. Transmission line inspection and maintenance traffic would occur infrequently, and would not involve large numbers of vehicles or workers.

MATL would utilize public rights-of-way (roads, streets, or highways) in some locations. According to Montana Code Annotated 2003 69-4-101, use of public right-of- way for utility lines

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and facilities allows for this. This use is allowed where the location of such facilities does not endanger the public.

The specific impacts and mitigation measures discussed below have been identified for the transmission line project with respect to effects on utilities and transportation.

Increased Traffic Levels: Construction of the transmission line would cause increased traffic levels on roadways used to transport equipment, materials, and personnel to construction areas. Peak-level construction traffic could increase the number of vehicle trips per day on roadways used for personnel access and equipment/materials delivery to worksites. Depending on location, construction personnel would likely access worksites using primary roadways in the Project Study Area. From these roadways, construction traffic would use either existing or newly constructed access roads to access construction areas. Because of the limited traffic volumes on all roadways and the low number of construction-related trips that would be necessary each day, traffic-related impacts associated with construction would be minor. Personnel trips and equipment movement necessary for operation of the transmission line would be minimal and transmission line monitoring would be limited to one or two vehicles at any one time. As such, impacts are not considered to be high, and no mitigation is proposed.

Proximity to Public Roadways: There are two ways that transmission line construction activities could affect the roadway network. Construction would either have to cross a roadway or it would run parallel to a roadway within or adjacent to the public right-of-way. Transmission line stringing activities over federal, state, and county roads could require the temporary closure of traffic lanes, potentially causing short-term traffic congestion.

Physical Damage to Roads: Construction traffic, especially vehicles used for equipment and materials movement, could potentially exceed the design weight capacities on local roadways, resulting in damage to these roadways during construction.

Proximity to Rail Facilities: Transmission line construction activities could affect rail facilities. Construction would either have to cross a railroad or it would run parallel to a railroad.

Adverse Affects on Aviation Activities: MATL will comply with all appropriate regulations of the Federal Aviation Administration (FAA), and a Notice of Proposed Construction or Alteration form (Form 7460-1) would be required of MATL pursuant to Federal Aviation Regulations, Part 77. Final locations, structures, and structure heights, and construction equipment that might impact air navigation such as cranes used to assemble the structures, would be submitted to the FAA for the Project Study Area. The form would be sent to the manager of the FAA Regional Air Traffic Division Office having jurisdiction over the area where the planned construction would be located. Coordination with the Department of Defense will be conducted as applicable, regarding the location and potential effects of transmission line operations in military airspace. The owner/operator of private airports and airstrips potentially affected by the Project will also be contacted.

State Highways: To fulfill requirements of MDT relative to encroachment and/or occupancy within highway rights-of-way, MATL will obtain the appropriate Occupancy and Location Agreement and applicable Encroachment Permit for each crossing of a state highway. The requirements of such approvals include submittal of engineer drawings and a detailed description of the line (alignment, specifications, structural requirements) where the line would cross or encroach on state highway ROW.

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4.6.4 Visual Resources

Circular MFSA-2 Overview and Baseline requirements identify: visual quality, visual compatibility, and visual contrast/absorption in relationship to surrounding landscape as necessary aspects of the assessment of visual resources within the Project Study Area. Because of the interdependence of these visual resource aspects, Overview and Baseline requirements are collectively evaluated.

Overview/Baseline

Existing Inventories [Circular MFSA-2 3.4.9.b, 3.7.10.d]

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Federal and state land managers, and local/county officials have not developed maps that establish an inventory of scenic attractiveness, distance zones or concern levels, scenic classes, and visual absorption capability for any portion of the Project Study Area.

Landscape Types [Circular MFSA-2 3.4.9.a] and Scenic Quality [Circular MFSA-2 3.4.9.c, 3.7.10.a, 3.7.10.c]

Three potential ranges of scenic quality are used to express the landscape's scenic value within the context of the physiographic region: Class A – Outstanding Scenic Quality; Class B – Above Average Scenic Quality; and, Class C – Common Scenic Quality. No Class A areas are present. Class B landscapes comprise less than 10 percent of the overall Project Study Area and include the Marias River Corridor, the Teton River Corridor, and the Kevin Rim. The remainder of the Project Study Area is represented by Class C landscapes. Extents of these areas are mapped on the Visual Quality Overview Overlay and the Visual Resources Baseline Overlay.

Six landscape types have been identified in the Project Study Area, and can be related to scenic quality Classes A, B, and C:

Alluvial corridors constitute narrow strips of land following major rivers crossing the Project Study Area. They are moderately diverse in terrain, vegetation, and water features. Corridors along Buckley Coulee, Cut Bank Creek, Abbott Coulee, Shultz Coulee, Dry Fork of the Marias River, Big Flat Coulee, and Flat Coulee are designated as Class C. The Marias River Corridor and the Teton River Corridor are designated as Class B due to expansive floodplains, diverse vegetation patterns, river meanders, and topographic relief present in the setting.

Three major *wetland areas* occur in the Project Study Area. Benton Lake is an extensive shallow lake in the southern portion of the Project Study Area. Prairie pothole wetlands occur extensively in the northwestern portion of the Project Study Area near Hay Lake. Several large wetlands occur between Shelby and Sweetgrass, along the railroad. All provide diverse vegetation, but have low landform diversity and are designated as Class C.

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Several *rims, ridges, and buttes* occur in the Project Study Area. The Kevin Rim is an escarpment in the northern Project Study Area. This rim defines the boundary of a shelf that runs from Cut Bank to Sweetgrass, but is most prominent northwest of Kevin. The Kevin Rim is designated as Class B given its high landform diversity and diverse vegetation. Other prominent features include Abbott Ridge and Trunk Butte south of Cut Bank, West Knob and East Knob north of the Teton River in Choteau County, Teton Ridge, and the Sun River/Missouri River Rim in the southern Project Study Area. These features offer less vegetation diversity with little visual variety and are therefore designated Class C designation.

Uplands and Benchlands comprise the majority of the Project Study Area. Benchlands are characterized by gently sloping terrain, expansive views, and irrigated cropland use. They occur predominately in the center of the Project Study Area between the Marias River and Pondera Coulee. The remainder of the Project Study Area constitutes rolling uplands with a fairly uniform landscape of gently sloping wheat fields and grassland. With only moderate diversity in croplands and associated farmsteads, these landscapes are designated Class C.

Developed landscape features occur throughout the Project Study Area. This includes urban and rural communities, recreation areas, Hutterite colonies, military installations, highways, and railroads. The following fall within Class B areas inside the Project Study Area: Interstate 15 (Marias River Corridor and Teton River Corridor) and the town of Naismith (Marias River Corridor). All others occur within Class C areas.

All route alternatives cross the Marias River Corridor and the Teton River Corridor, each classified as above average, or Class B, scenic quality. The Preferred Route (Alternative A) crosses about 0.96 mi of Class B scenery; Alternative B crosses about 0.83 mi and Alternative C crosses about 1.11 mi. The remaining extent of these route alternatives traverses Class C scenery, of common scenic quality. No outstanding, or Class A, scenery exists along these route alternatives.

Visual Compatibility [Circular MFSA-2 3.4.9.d, 3.7.10.b, 3.7.10.c]

Visual compatibility is a measure of public concern over visual changes caused by introducing a transmission line to the landscape. It addresses both viewer sensitivity and landscape sensitivity. Viewer sensitivity considers the effect of viewing location types and distance from the viewing location on public attitudes to landscape change. Landscape sensitivity considers different levels of public concern over change in scenic quality in selected landscape types. Together, viewer sensitivity and landscape sensitivity are used to determine the overall visual compatibility.

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Viewer sensitivity is highest in the foreground and middleground distance zones (up to 1 mi) from residential areas, recreation sites, and highways. Introduction of a transmission line into otherwise generally open, expansive views would be considered low compatibility with these landscape features. The extents of residential areas, recreation sites, and highways are mapped on the Land Use/Cover and Linear/Point Feature Overview and Baseline Overlays. Foregrounds of these areas are depicted on the Visual Resources Baseline Overlay.

The Marias River Corridor and the Teton River Corridor are moderately compatible with the proposed alternatives. Given the scarcity of major river valleys in this portion of Montana, these areas have relatively moderate landscape sensitivity compared to most other natural landscapes in the Project Study Area. Extents of these areas are mapped on the Visual Quality Overview Overlay (**Figures D-8**) and the Visual Resources Baseline Overlay (**Figures E1a-E14a**). The remainder of the natural landscape in the Project Study Area – including uplands, benchlands, rims, ridges, buttes, and wetlands – has generally low landscape and viewer sensitivity.

Key Observation Points [Circular MFSA-2 3.7.10.e through h]

Key observation points (KOP's) are major travel routes, recreation areas, and residential areas from which significant numbers of people view the landscape. The appearance of the project and surrounding landscape varies with viewing distance. Land seen from a KOP is divided into three zones: foreground (0.25 mi from the KOP); middleground (0.25 to 1 mi from the KOP); and, background (1 mi to 5 mi). Where topographic breaks mask viewsheds from KOP's, these distances can actually be less. These buffer distances are used, however, to generally compare visual impacts from each route alternative.

Major travel routes that were considered include: Interstate 15, U.S. Highways 2 and 87, and Montana State Highway 44. Each of these highways is crossed by each alternative. Alternative A is in the foreground of primary highways for about 4.6 miles and this alternative is in the highway middleground for about 10.5 miles. Alternative B is in the foreground of primary highways for about 5.1 miles and in the middleground for about 11.9 miles. Alternative C is in highway foregrounds for about 2.8 miles and in the middleground of primary highways for about 8.2 miles. The remainders of these routes are either within the background or seldom seen from major travel routes.

According to the most recent available Montana Department of Transportation statistics for automatic traffic recorder sites, Station A61 along I-15 south of Shelby had an average daily traffic count of 2,781 vehicles in 2004. Interstate 15 just north of Great Falls had an average daily traffic count of 8,530 at Station A9. Route 89 just north of the junction with Hwy 534 (station A39) had an average daily traffic count of 400 vehicles in 2004.

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Each alternative crosses recreation areas considered along the Lewis and Clark National Historic Trail and the Teton and Marias river corridors. The endpoint of each alternative is within the foreground of the Missouri River Corridor and several developed recreation areas including Giant Springs State Park, the Lewis and Clark Interpretive Center, and the Lewis and Clark Heritage Greenway. Each alternative also crosses the Great Falls Shooting Sports Complex located north of Great Falls. Alternative A and B cross the foreground of Benton Lake National Wildlife Refuge. Other recreation areas considered, but not within the foreground, include waterfowl production areas, research natural areas, and other sporting venues/complexes (e.g., golf courses, race tracks, rodeo arenas, city parks) located along route

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alternatives in Cut Bank, Conrad, and Great Falls. There are 19 individual occupied residences within 0.25 mi of Alternative A; 17 are within the foreground of Alternative B and the foregrounds of 14 houses are crossed by Alternative C. No residential clusters are located within 0.25 mi of any of the alternatives. The visual foreground of one colony – the Zenith Colony north of Cut Bank – is crossed by Alternative A and B. No colonies are within 0.25 mi of Alternative C. Alternative A crosses about 3.6 mi of the visual foreground of these residential areas. Alternative B crosses about 3.8 mi of residential visual foreground and Alternative C is within about 4.25 mi of residential foreground.

Environmental Consequences (Visual Impacts)

The primary corridor siting features associated with visual resources were foreground distance zone views from major travel routes, recreation areas, and residential/urban areas. Visual impacts are considered adverse, direct, and long-term. Generally, a high visual impact will occur in an area of outstanding or above average scenic quality or within 0.25 mi (i.e., the foreground) of residences, recreation areas, or highways. Moderate impacts would generally occur within 0.25 to 1 mi (i.e., the middleground) of residences, recreation areas, or highways. A low visual impact occurs in background distance zone areas. In assessing the visual impact of the project, the minimum impact would be low, since there would always be some level of identifiable impact.

High visual impacts were identified along 23.2 mi of Alternative A and moderate impacts along 68.7 mi of the route. Along Alternative B, high visual impacts were identified along 22.8 mi of the route and moderate impacts along 63.57 mi of the route. High visual impacts were identified along 17.5 mi of Alternative C and moderate impacts along 64.8 mi of the route. The remainder of each route is generally subject to low visual impacts. Mitigation measures can reduce site specific visual impacts to some degree, but would not effectively reduce initial impacts to lower levels.

4.6.5 Human Health and Environment [MFSA-2 Section 3.7.19.a-g]

This section evaluates potential impacts on Human Health and Environment resulting from electrical effects of the proposed 230-kV transmission line. Voltage and current required to transmit electrical power over the transmission line result in electrically charged particles causing effects some distance away from the line. These effects, commonly referred to as Electromagnetic Field (EMF), can be characterized as “corona effects” and “field effects”. Corona is the electrical breakdown of air into charged particles caused by the electrical field at the surface of conductors, insulators, and hardware of energized high-voltage transmission lines, and is enhanced by irregularities (including rain drops) on those surfaces. Known corona effects include audible noise, visible light, radio and television interference, and photochemical oxidants. Of these, Circular MFSA-2 requires assessment of audible noise, and radio and television interference.

Field effects are characterized as induced current and voltage in conducting objects near the line, spark discharge shocks, steady state current shocks, field perception at ground level, and magnetic field. Of these, *Circular MFSA-2* requires evaluation of potential human health effects resulting from exposure to electric and magnetic fields, and potential for voltage induction and creation of currents on nearby conducting objects.

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Circular MFSA-2 does not specify Overview requirements for EMF-related human environment factors. However, Section 3.7.19 does require the applicant to establish general baseline conditions within the existing environment to evaluate potential effects that are largely distance dependent. As a result general, background information is provided based on the existing environment, and industry research and standards to provide a basis for evaluating potential impacts.

Finally, MATL's primary engineering design contractor, SNC-Lavalin, conducted project specific evaluations of audible noise (AN), radio and television interference (RI and TVI), electric and magnetic field effects (EMF), and induced current and voltage. Assumptions necessary to conduct these evaluations included the following:

- Power flow, voltage, and ampacity: 300 megawatts, 253 kV, and 753 amperes, respectively.
- National Electric and Safety Code (NESC) ground clearance of 19.72 feet.
- Phase conductor: single conductor 1033.5 ACSR Curlew, diameter 1.246 inches.
- Overhead Shield Wire (OHSW) conductor: 5/16" steel, diameter 0.327 inches.
- H-frame support structures.
- Uniform soil layer of 20 mmhos/m for soil conditions.
- 45 foot RoW coupled with 30 foot left/right safety zones (total width = 105 feet).
- Rain rate (applicable to audible noise) of 0.14 inches per hour.
- Average elevation of 3,543 feet.
- Radio and television signal frequencies: 0.1 – 20 MHz, and 75 MHz, respectively.
- Height above ground: magnetic field = 3.28 feet, electric field = 3.28 feet, AN = 5 feet, RI = 6.56 feet, TVI = 10 feet.

4.6.5a Audible Noise [MFSA-2 3.7.19.a and d]

With the exception of the immediate Cut Bank area, the proposed project alternatives are located in a rural, predominantly agricultural area. As a result, sources of background noise to rural residents and occasional visitors to the area include wind, agricultural activity, recreation (primarily hunting), and vehicles traveling the numerous county and state roadways, and Interstate 15 in proximity to these alternatives. Some typical noise levels are: light automobile traffic at 100 feet, 50 decibels (A-weighted; dBA); an operating air conditioning unit at 20 feet, 60 dBA; and freeway traffic or freight train at 50 feet, 70 dBA. This last level represents the point at which a contribution to hearing impairment begins.

General noise level data from the U.S Environmental Protection Agency (USEPA) and the National Transit Institute were used to provide a typical sound level range for rural residential and agricultural cropland uses. Typical baseline noise levels in the Project Study Area likely range from approximately 38 average day-night sound levels measured in A-weighted decibels (dBA) to 48 dBA (USEPA 1978).

Audible noise from transmission lines is due to point source corona and is a function of conductor voltage gradient, which is increased by irregularities on the conductor surface and hardware due to burrs of the material when new, and rain droplets on the surface. Corona-generated audible noise is generally characterized as crackling and hissing that is most noticeable during wet-conductor conditions such as rain, snow, or fog. **Table 4.6-16** provides a summary of rainfall frequency data for several communities within the Project Study Area from the Western Regional Climate Center (wrcc@dri.edu).

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There are no design-specific regulations to limit audible noise from transmission lines in the state of Montana. However, Bonneville Power Administration (BPA) design criterion for corona-generated AN (L50, foul weather) is 50 +/-2 dBA at the edge of the RoW (BPA, 1982).

TABLE 4.6-16
SUMMARY OF MONTHLY AVERAGE PRECIPITATION
MONTANA ALBERTA TIE LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Location	Monthly Average for the Period of Record Measured in Inches												Annual
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Cut Bank (12/1/1903 – 3/31/2005)	0.35	0.30	0.43	0.81	1.86	2.72	1.49	1.36	1.10	0.49	0.33	0.33	11.57
Shelby (4/1/1950 – 3/31/2005)	0.39	0.31	0.52	0.85	1.78	3.01	1.33	1.15	0.84	0.51	0.35	0.39	11.45
Conrad (3/1/1911 – 3/31/2005)	0.38	0.32	0.61	1.02	1.88	2.70	1.40	1.25	1.06	0.58	0.39	0.41	11.98
Great Falls (1/1/1893 – 12/31/1956)	0.60	0.58	0.93	1.07	2.31	3.10	1.47	1.15	1.36	0.81	0.66	0.62	14.67

Reference: Western Regional Climate Center, wrcc@dri.edu

Baseline

Table 4.6-17 identifies the AN values calculated when simulating the 230-kV line for both H-frame double poles (assumptions above), as well as a single pole structure. Review of Table 4.6.5-2 indicates that for H-frame double poles, AN levels of 46.23 dBA, and 49.56 dBA would be expected at distances of 100 feet, and 52.33 feet (edge of safety zone) from the proposed Project centerline, respectively.

TABLE 4.6-17
AUDIBLE NOISE (AN) EFFECT
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Pole Type	Distance from Centerline (feet)	Audible Noise (dBA) (L_{50})
H-frame Double Pole	100	46.23
	52.33	49.56
	100	47.13
	54	50.00
	30.18	52.48

Note: Estimates calculated using Corona and Field Effects Program (Kingery 1991), and based on conductor ground clearance of 19.72 feet (NESC specification). dBA (L_{50}) = decibles (A-weighted) during foul weather, indicated by L_{50}.

Environmental Consequences

Exceedance of ambient noise levels at sensitive receptors (e.g., residences) could result in a significant noise impact. In response, MATL is considering the following measures to mitigate potential noise impacts to sensitive receptors in the siting and design of the proposed Project:

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- Siting of the transmission line and associated transformers with consideration of distance to sensitive receptors including residential developments, individual occupied residences, churches, schools, and other public meeting places.

- Design or follow-up measures to reduce AN including Installation of conductor shielding, and maintenance to tighten loose insulators and connections to reduce vibration in response to complaints or at landowners requests.

Based on distances, comparisons to specific noise sources and ambient noise levels, and available mitigation measures, potential noise impacts resulting from operation of the proposed Project would be negligible. This conclusion is supported by SNC's AN calculations at the edge of the proposed safety zone (52.33 feet from centerline) that indicate AN levels would be below commonly accepted guidelines.

4.6.5b Radio Interference (RI) and Television Interference (TVI) [MFSA-2 3.7.19.f]

The most significant factor with respect to radio and television interference is not the level of the transmission line induced noise, but how it compares with the strength of the broadcast signal. Very few problems have been associated with existing 230-kV transmission line radio noise have been documented. A transmission line of the size of the proposed 230-kV line is not usually located close to residences, and radio stations generally have adequate signal to noise ratios such that interference is not a problem.

If corona generated interference does occur, complaints typically occur from listeners of the amplitude modulated (AM) broadcast band. Frequency modulated (FM) radio reception is rarely affected. An acceptable level of maximum fair-weather radio interference at the edge of a RoW is 40 dBuV/m (decibles above one microvolt per meter). Average levels during foul weather are typically 16 to 22 dB higher than average fair-weather levels (Maddock 1992).

Corona generated radio frequency noise is quite small in the very high frequency (VHF) range used for television transmission. Television interference (TVI) due to corona is usually observed only during foul weather and generally only associated with transmission lines with voltage greater than 345 kV. In addition, modern-day cable and satellite television are not subject to corona-generated interference.

Corona-generated interference does not typically disrupt communication bands such as the citizen's and mobile bands because of their FM operation. Interference of citizen's and mobile communications usually result from signal blocking effects. Because no lattice steel towers are contemplated for the proposed 230-kV line, this is not expected to be a problem. Noise in the frequency range of cellular type phones is almost non-existent and the technologies used by these devices is superior to that used in two-way mobile radio.

Baseline

Table 4.6-18 provides RI and TVI values generated by MATL's proposed 230-kV transmission line (for both the proposed H-frame double pole, as well as single pole structure) with ground clearance requirements as specified by the NESC.

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RADIO INTERFERENCE (RI) AND TELEVISION INTERFENCE (TVI) EFFECT¶
MONTANA ALBERTA TIE, LTD.¶
LETHBRIDGE, AB – GREAT FALLS, MT** ... [130]

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TABLE 4.6-18
RADIO INTERFERENCE (RI) AND TELEVISION INTERFENCE (TVI) EFFECT
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

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Pole Type	Distance from Center Line (feet)	Radio/Television	Frequency (MHz)	Interference (dBuV/m) (L_{50})
H-frame Double Pole	120 (100 ft from outside conductor)	RI	0.5	33.7
			0.834	30.2
			1	28.7
			1.25	26.7
			1.5	24.9
			2	21.8
		TVI	75	19.8
Single Pole	120 (100 ft from outside conductor)	RI	0.5	39.8
			0.834	36.3
			1	34.8
			1.25	32.8
			1.5	31.1
			2	28.1
		TVI	75	21.43

Note: Estimates calculated using Corona and Field Effects Program (Kingery 1991), and based on conductor ground clearance of 19.72 feet (NESC specification).
MHz = Megahertz
dBuV/m (L50) = decibels above 1 volt per meter during foul weather (L_{50}).

Environmental Consequences

Various techniques exist for eliminating adverse impacts on radio and television reception. MATL would address individual complaints concerning radio and television interference as needed. Potential mitigation measures to address potential complaints include:

- MATL will inspect and repair any loose or damaged hardware in the transmission line to alleviate or minimize corona effects.
- MATL will take necessary action to restore reception to the pre-project level, including the appropriate modification of receiving antenna systems, and/or system shielding, if deemed necessary.

4.6.5c Electric and Magnetic Field (EMF) Effects [MFSA-2 3.7.19. b, c and e]

The term electromagnetic field (EMF) technically refers to electric and magnetic fields that are coupled together such as in high frequency radiating fields. For lower frequencies such as for power lines, EMF should be separated into electric fields and magnetic fields. Transmission lines operate at a frequency of 60 hertz, which is in the non-ionizing portion of the electromagnetic frequency spectrum. Fields are considered ionizing when they cause electrons to eject from their orbits around a normal atom. This will typically occur with frequencies in the range of 10^{16} to 10^{22} hertz.

Current and voltage, required for transmission of electrical energy, are measured in amperes and volts or kilo-volts (kV), respectively. Current is flow of electrical charge and the source of a magnetic field. Magnetic field density is expressed in the unit of gauss (G) or milligauss (mG). The magnetic field associated with a transmission line surrounds the conductor and its density rapidly decreases with the distance from the conductor.

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Voltage represents the potential for an electrical charge to do work and is the source of an electrical field. Electric field is expressed in a unit of volts per meter (V/m) and similarly to magnetic field density, decreases rapidly with distance from the conductor.

Questions concerning effects of long-term exposure to electric and magnetic fields from transmission lines on human health are a controversial subject that has been raised primarily in hearings related to 500-kV and 765-kV transmission lines. These high voltage lines induce electrical fields at ground levels more than twice the maximum electrical field estimated under the proposed 230-kV MATL line. Although available evidence has not established that induced electrical and magnetic field effects pose a significant health hazard to exposed humans, the same evidence does not prove there is no hazard.

MATL researched several standards commonly adopted by industry, and current studies on potential health effects related to EMF. Brief summaries of these standards and notable articles are provided below:

The American Conference of Governmental Industrial Hygienists (ACGIH) have developed reference standards for occupational exposure to electric field and magnetic field effects of 25 kV/m, and 10,000 mG, respectively (ACGIH, 2003).

The Institute of Electrical and Electronics Engineers (IEEE) have recommended standards for both residential and occupational exposure to electric field and magnetic field effects. These are: Electric Field = 5 KV/m (residential), and 20 KV/m (occupational); Magnetic Field = 9000 mG (residential), and 27,100 mG (occupational).

A 2002 report by the Department of Health Services, State of California, *An Evaluation of the Possible Risks from Electric and Magnetic Fields from Power Lines, Internal Wiring, Electrical Occupations, and Appliances*, was prepared in response to the California Public Utilities Commission. The three preparing scientists agreed, to one degree or another, that EMF can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's disease ad miscarriage. They strongly believe that EMFs do not increase the risk of birth defects or low birth weight. They strongly believe EMFs are not a universal carcinogen. The scientists were not in universal agreement that EMFs are related to other conditions such as heart disease, Alzheimer's disease, suicide and adult leukemia.

A team of Canadian researchers led by McBride reported in the May 1999 issue of the American Journal of Epidemiology that if there is a risk (of childhood leukemia from EMF exposure) it is undetectable through epidemiological studies (McBride 1999).

A study sponsored by the National Institute of Health (NIH), National Institute of Environmental Health Sciences (NIEHS) was published in June 1999: *Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*. The report stated that all theories concerning biological effects of EMF "suffer from a lack of detailed, quantitative knowledge," and concluded that laboratory data using a variety of animals such as non-human primates, pigeons, and rodents are inadequate to conclude that exposure to EMF fields alters the rate of patterns of cancer and has not been adequately demonstrated for non-cancer health issues (i.e. birth defects, etc.). As a precaution regarding human health issues, the report recommends that the electrical field at the edge of a right-of-way measured one meter above ground not exceed 1 kV/meter, and considered this recommendation conservative (NIH 1999).

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Baseline

Table 4.6-19a provides the electric and magnetic field values generated by MATL's proposed H-frame 230-kV transmission line with ground clearance requirements as specified by the NESC. Table3 4.6-19b provides electric and magnetic field values generated by a single pole structure. Graphs generated using Corona software that depict electric and magnetic field strengths over distance from the transmission centerline are shown on **Figures 4-2** to 4-5.

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TABLE 4.6-19a
EMF EFFECTS
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

H-frame Structure	Location	Distance from Center Line (feet)	Electric Field (KV/m)	Magnetic Field (mG)
NESC Ground Clerance: 19.72 ft.	Below Conductor	21.65	5.858	254.34
	RoW Edge	22.47	5.871	248.76
	Safety Zone	52.33	1.522	69.37
	Guidance Limit	60.6	1	51.37

TABLE 4.6-19b
EMF EFFECTS
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Single Pole Structure	Location	Distance from Center Line (feet)	Electric Field (KV/m)	Magnetic Field (mG)
NESC Ground Clerance: 19.72 ft.	Below Conductor	8.66	4.989	175.12
	RoW Edge	10.17	4.985	171.178
	Safety Zone	30.18	1.730	80.905
	Guidance Limit	39	1.005	55.936

Note: Estimates calculated using Corona and Field Effects Program (Kingery 1991), and based on conductor ground clearance of 19.72 feet (NESC specification).
KV/m = kilovolts per meter
mG = milligauss

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Figure 4-4

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Environmental Consequences

A significant impact on safety and health as a result of the proposed Project would occur if features of the proposed action have demonstrated adverse health effects. Specifically, these would include increased risk of injuries or deaths resulting from potentially higher risk of adverse health symptoms (including those to pacemaker wearers) resulting from increases in electric and magnetic fields in the area.

As for general mitigation, if the electric and magnetic field (EMF) effects are too high at a specific physical place, then the line could be built higher in the air to decrease the effects (in that place). In addition, electric fields are fairly effectively reduced by barriers such as walls. Magnetic fields are not reduced by barriers.

EMF has been studied for over 20 years, and no repeatable adverse effects have been found. MATL's stance is that no specific EMF related mitigation is necessary for this project given the levels of the electric and magnetic fields at a standard edge of right of way and the rural nature of this project. For comparison sake, the occupational guidelines developed by the American Conference of Governmental Industrial Hygienists state that workers with pacemakers should not be exposed to a 60 Hz magnetic field greater than 1000 mG (1 Gauss). The level of the magnetic field at the edge of the right of way for the transmission line is projected to be 68.538 mG (0.0685 Gauss) for an H-Frame structure and 76.552 mG (0.0766 Gauss) for a single pole structure.

In addition, the vast majority of each alternative route crosses rural lands. Line alternatives were sited to specifically avoid residential areas. Therefore, while the state of Montana has a standard electric field value of 1 kV per meter at the edge of the right of way for residential areas (ARM 17.20.1608) this project specifically avoids residential areas, making mitigation unnecessary.

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Calculated magnetic field strengths can be compared to those recommended for residential and occupational exposure by the IEEE and ACGIH. These fall well below the recommended levels.

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4.6.5d Induced Current and Voltage [3.7.19.b and c]

When a conducting object, such as a vehicle or person, is placed in an electric field, currents and voltages are induced in that object. The magnitude of the induced current depends on the strength of the electric field and size and shape of the object. Voltage induction and creation of currents in long conducting objects such as fences and pipelines would be possible near the proposed transmission line. If the object is grounded, the induced current flows into the earth and is called the short-circuit current of the object. In this case, voltage on the object is effectively zero. If the object is insulated (not grounded), then it assumes some voltage relative to ground. These induced currents and voltages represent a potential source of nuisance shocks near a high voltage transmission line.

In addition, buried steel pipelines are typically charged with a low-amperage current to provide cathodic protection against corrosion. Induced currents and voltages resulting from nearby transmission lines have the potential to interfere with that cathodic protection system.

Baseline

A preliminary study was undertaken to analyze the inductive effects on paralleling linear facilities caused by MATL's proposed 230kV transmission line when operating under steady state and single line to ground fault conditions. The purpose of the study was to assist in

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making an assessment for route selection purposes only, regarding the consequences of some fairly long parallels between the proposed power line route and existing pipelines, and railroad tracks. One of the most effective ways in terms of cost and schedule to mitigate pipeline voltages caused by induction or conduction is to maintain adequate separation between both facilities. The resulting selected route for the power line did not necessarily eliminate all parallels but it did allow sufficient distance so that anticipated induced voltages could be at manageable levels with some mitigation put in place.

Typical values were used for the calculations because it was considered too early in the project to contact pipeline owners requesting information that may or may not be required. For example, all calculations were based on a twenty inch steel pipe and typical pipeline insulation coating values. The power line geometry is similar to what MATL was intending to use as of July 2005.

The targeted pipeline voltages to be maintained when the power line is operating at steady state conditions of 500 MVA are 50 volts for below ground facilities and the CSA limit of 15 volts for the above ground facilities. Targeted pipeline voltage level of 5000 volts is to be maintained when the power line experiences single line to ground faults with a current magnitude of 5000 amperes. Those conditions resulted in target separation distances of 100 meters or more for parallel lengths up to 5 km and 800 meters for parallels longer than 5 km. Also a target of 30m from observed underground facilities for angles and dead-ends was sought in order to minimize the effects of the ground potential rise when a ground fault occurs on the power line.

Environmental Consequences

All of the above values are order of magnitude and are for route selection purposes only. These values need to be re-visited when the route is approved, pipeline locations and characteristics are confirmed, as well as soil resistivity determined.

4.6.6 Recreation

This section describes recreational opportunities and resources within the Project Study Area and the three alternative routes. Information regarding recreation was obtained from the Montana Department of Fish, Wildlife, and Parks (MFWP), and Benton Lake National Wildlife Refuge (NWR). Data regarding land cover type and land use were obtained from Montana GAP Analysis (Fisher et al. 1998) and the Montana CAMA Dataset (see Section 4.5.1). Cover types and land use were also assessed during field reconnaissance surveys and from aerial photo interpretation.

Overview

Recreation within the Project Study Area typically consists of dispersed hunting, fishing, birding and wildlife observation, and shooting sport opportunities. The only designated recreation site within the Project Study Area is the Lewis and Clark National Historic Trail, which is crossed at the Marias River crossing by all three alternatives and is shown in **Figures D-7**. The Historic Trail is also within the buffer surrounding the Project's terminus at Great Falls but is not crossed by the Project. A shooting range also exists northeast of Great Falls within the Project Study Area on state land.

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Hunting data within the Project Study Area are compiled by MFWP through harvest surveys and are presented as descriptive information for the entire Project Study Area by county or hunting district in **Table 4.6-20a**.

TABLE 4.6-20a
HUNTER DAYS FOR UPLAND GAME BIRD, DEER, AND ANTELOPE WITHIN THE GENERAL PROJECT AREA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

	Upland Game Bird						**Deer**			**Antelope**	
	County						**District**				
Hunter Days[1]	Cascade	Choteau	Glacier	Pondera	Teton	Toole	403	404	406	401	404
	13,887	13,995	1,151	10,198	11,697	2,794	842	11,606	3,308	854	701

[1] Number of days or partial days spent hunting upland game birds, deer, or antelope (MFWP 2004, MFWP 2004a, MFWP 2004b).

Wildlife observation data within the Project Study Area are compiled by the U.S. Fish and Wildlife Service (USFWS) for National Wildlife Refuges' and Wetland Production Areas (WPA) and are presented in **Table 4.6-20b**. Data are presented as descriptive information for the Benton Lake NWR individually and the 19 WPAs in aggregate that are within the general project area. Hunting and wildlife observation data are not available for the three specific WPA's within the Project Study Area (Johnson, pers. comm.).

TABLE 4.6-20b
HUNTER DAYS AND RECREATIONAL VISITS AT BENTON LAKE NWR AND WATERFOWL PRODUTION AREAS WITHIN THE GENERAL PROJECT AREA
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

	Benton Lake NWR	**Waterfowl Production Areas**
Hunter Days[1]	500	1200
Wildlife Observations[1]	8000	400

[1] Number of days or partial days spent hunting or observing wildlife at Benton Lake NWR or at the 19 Waterfowl Production Areas east of the Continental Divide within Cascade, Choteau, Glacier, Hill, Lewis and Clark, Liberty, Pondera, Powell, Toole, and Teton counties (Johnson, USFWS pers. comm.).

Recreational opportunities within the Project Study Area are primarily related to rural land uses such as farming and ranching as well as high quality streams, rivers (Class I or II as defined by MFWP), and wetlands with recreational value. The miles of farmland and non-farmland land use within the Project Study Area are presented in *Section 4.5.1*, **Table 4.5-4**. There are no Class I or II streams or rivers within the Project Study Area (MNRIS 2005). High-quality wetlands with recreational value within the Project Study Area include Benton Lake NWR, three WPA's, and possibly several potholes in northwestern Glacier and northeastern Toole counties. Also, the Kevin Rim Area of Critical Environmental Concern, an area of public land designated as critical raptor habitat, is located within the Project Study Area in northeastern Toole County. Finally, the McLean State Game Preserve occurs within the Project Study Area west of Conrad.

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Baseline

Designated hunting, fishing, and recreational areas include the McLean State Game Preserve, which is crossed by Preferred Alternative A west of Conrad, and the Lewis and Clark National Historic Trail, which is crossed by each alternative at or near the Marias River immediately below the confluence of the Two Medicine River and Cut Bank Creek, and crossed by each alternative along respective crossings of the Teton River Corridor. The Lewis and Clark National Historic Trail is also included within the terminus buffer of all routes at Great Falls but is not crossed by any alternative at this point. The endpoint of each alternative is within the foreground of the Missouri River Corridor and several developed recreation areas including Giant Springs State Park, the Lewis and Clark Interpretive Center, and the Lewis and Clark Heritage Greenway. Each alternative also crosses the Great Falls Shooting Sports Complex located north of Great Falls. Alternative A and B cross the foreground of Benton Lake National Wildlife Refuge. Other recreation areas considered, but not within the foreground, include waterfowl production areas, research natural areas, and other sporting venues/complexes (e.g., golf courses, race tracks, rodeo arenas, city parks) located along route alternatives in Cut Bank, Conrad, and Great Falls.

GIS data sets used to make this determination, and to generate foregrounds, include:

- Lctrail
- Nwr
- Spec_mgt_areas
- Fwplands
- Parsedrecreationsites
- Fwp_aoi_streams

All rivers and streams crossed by any alternative are Class III or higher indicating relatively poor fisheries potential compared to Class I or II waterbodies. Further, no high-quality recreational wetlands (including WPA's and the Benton Lake NWR) are located within any of the alternative corridors.

Of specific note, recreational areas and dispersed recreational use areas within the one-mile buffer of alternative routes include:

- Alternatives B & C -- Cut Bank public little league ball fields northeast of town on Nyhagen Road. Estimated use is 300 – 500 people per year (per Norman's Sports, Cut Bank, MT 1/10/06).
- Alternatives B & C -- Cut Bank Saddle Club, private club southeast of town on U.S. Highway 2. Estimated use is 75 – 100 people per year (per Norman's Sports, Cut Bank, MT 1/10/06).
- Alternative A – Cut Bank Golf and Country Club, private club southwest of town on Valier Highway. Estimated use is 500 – 750 people per year (per Norman's Sports, Cut Bank, MT 1/10/06).
- Alternatives A, B & C – Lewis and Clark National Historic Trail is paralleled and crossed by all alternatives between Cut Bank and the Marias River. No estimate of recreational use at these sites.

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All rivers and streams crossed by any alternative are Class III or higher indicating relatively poor fisheries potential compared to Class I or II waterbodies. Further, no high-quality recreational wetlands (including WPA's and the Benton Lake NWR) are located within any of the alternative corridors.

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- Alternatives B & C – Pondera Golf Course west of Conrad on Sunset Blvd. No estimate of use, 100 members of private, non-profit golf club (per Conrad City Public Works, Conrad, MT 1/10/06).
- Alternatives B & C – Public little league fields southwest of Conrad on Pendroy Road. Estimated use is "several hundred" people (per Conrad City Public Works, Conrad, MT 1/10/06).
- Alternatives A, B & C – Lewis and Clark National Historic Trail is crossed by all alternatives at or near their respective Teton River crossings. No estimate of recreational use at these sites.
- Alternatives A, B & C – Lewis and Clark National Historic Trail is crossed by all alternatives between the Teton River and Great Falls east of Benton Lakes NWR. No estimate of recreational use at these sites.
- Alternatives A, B & C – Great Falls Shooting Sports Complex is crossed by all alternatives north of the terminus point. Approximately 400 members currently use the site with 1000 members projected to use the site in the near future (per Jim Panagopoulas – President Great Falls Shooting Sports Complex, 1/9/06).

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Environmental Consequences

Land use and cover type data indicate very minor differences among the alternatives. All three alternatives traverse a similar rural landscape and there are no substantive differences among the amount of farmland, grassland (native or introduced), and forest land on the three alternatives (see Section 4.5.1). Consequently, differences in hunting, fishing, wildlife observation, or shooting sport activities among the three alternatives are not based upon land use or land cover types. Further, with the exception of the Lewis and Clark National Historic Trail crossing at the Marias River and at the terminus buffer at Great Falls, as well as the shooting range northeast of Great Falls, there are no recreational areas, fishing access sites, or other developed recreational sites within any alternative corridor. Finally, with the exception of the McLean State Game Preserve, there are no designated wildlife sanctuaries, WPA's or other designated wildlife related areas within any alternative corridor.

Due to the lack of difference among the three alternative routes relative to recreational resources, potential impacts are discussed in aggregate for the entire Project Study Area and not by individual alternatives.

Potential adverse impacts to recreational resources within the Project Study Area are very limited. Significant impacts for this project are assessed relative to four criteria:

Criteria 1: an alternative prevents access to established recreational, hunting, fishing, or wildlife observation areas;
Criteria 2: an alternative increases access (through additional roads) to established recreational, hunting, fishing, or wildlife observation areas;
Criteria 3: an alternative substantially decreases wildlife populations resulting in negative impacts to hunting or wildlife observation;
Criteria 4: an alternative would significantly decrease the aesthetic nature of a designated recreational area.

Criteria 1 and 2: MATL will not close any existing public or private access road on any alternative route. In addition, measures (**Table 5.3-1**) to reclaim and/or close travel routes and access roads created during construction would prevent additional public use of land for hunting or other recreational activities and would result in no impact to or from recreational use of the

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Project Study Area. Consequently, there would be no significant impacts to recreational resources relative to Criterias 1 or 2.
Criteria 3: The only designated hunting or fishing site on any alternative is the McLean State Game Preserve on Preferred Alternative A. Measures to prevent waterfowl collisions and raptor predation of upland game at the game preserve and in other concentrated game bird areas would result in no significant impact to waterfowl and upland game (Section 4.5.3 and **Table 5.3-1**). There would be no significant impact to recreational resources relative to Criteria 3.

Criteria 4: The only designated recreational feature within any alternative corridor is the Lewis and Clark National Historic Trail. The existing landscape in the Marias area is primarily a native cottonwood riparian forest. However, bridges, fences, rural residences, communication towers, and small powerlines in the immediate vicinity of each alternative contribute to a sense of limited development in most of the Project Study Area. At Great Falls, the powerline would be part of an urban landscape.

The MATL powerline would further contribute to a departure from the original conditions present at the time of Lewis and Clark. However, given the degree of development throughout the overall trail including the portions of the trail within the Project Study Area, the impact of the MATL powerline would not significantly decrease the aesthetic nature of the Lewis and Clark National Historic Trail and would not result in a significant impact relative to Criteria 4.

Finally, the shooting range is approximately one-half mile east of the MATL centerline. Construction and maintenance of the powerline would not prevent use of the site and no significant impact would occur as a result of powerline activities near this site; consequently, there would be no significant impact relative to Criteria 4.

Site Specific Information - Impacts associated with each of the individual sites identified in the Baseline Section are discussed below:

- Cut Bank little league field, Cut Bank Saddle Club, Cut Bank Golf and Country Club, Pondera Golf Course, Conrad little league field – No Impact. Access and use of these sites would not be affected by construction of the proposed project. Aesthetics would not be significantly affected since none of these sites are within the visual foreground.
- Lewis and Clark National Historic Trail crossings between Cut Bank and the Marias River, all alternatives – Impacts would not be significant. Two existing powerlines and one existing pipeline occur in close proximity to the proposed project within this section of the study area. Recreational use of the Trail within this area is estimated to be very low due to poor access. Use of the trail would not change due to the proposed project. Aesthetic impacts would be less than significant due to the existing industrial facilities in the immediate area.
- Lewis and Clark National Historic Trail near Teton River crossing, Alternatives A & B– Impacts would not be significant. One existing powerline and two existing pipelines occur within the immediate study area of Alternatives A and B. Recreational use of the Trail within this area is estimated to be very low due to poor access. Use of the trail would not change due to the proposed project. Aesthetic impacts would be less than significant due to the existing industrial facilities in the immediate area.
- Lewis and Clark National Historic Trail near Teton River crossing, Alternative C. Impacts would be substantial. Industrial facilities are not located in this area. Although recreational use of the site is likely low due to poor access and would not change as a result of the project, a powerline in this area would detract from the aesthetics of an isolated recreational experience.

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- Great Falls Shooting Sports Complex, all alternatives – Mitigable impact. Officers of the GFSSC have indicated that consultation on structure placement so as to avoid current and future features of the facility as well as noxious weed control would mitigate any aesthic or use impacts to the facility. (per Panagopoulas and Hill, 1/9/06).
- Lewis and Clark Interpretive Center, Giant Springs State Park, Lewis and Clark Heritage Greenway Easement, all alternatives – Non-significant impact. Five existing transmission lines occur within the immediate study area and within the foreground viewshed of portions of these public facilities. The addition of another powerline would not substantially increase the already industrialized aspect of the area. Mr. Semler of FWP has indicated that the viewshed in this area is already impacted by powerlines and other features. Currently it is unclear if the terminus point would physically affect the northern edge of the Lewis and Clark Heritage Greenway Easement. Additional surveys and a review of the easements conditions should be completed to determine if the easement would be affected and if the terms of the easement would be violated by further powerline development.

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4.6.7 Cultural Resources

This section describes the cultural context (overview) of the general project region, as well as specific cultural resources identified during a Class I records search of relevant portions of the Project Study Area. A Class III pedestrian survey of the impact zone, or Area of Potential Effect (APE), along the preferred alternative route in Summer 2006.

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Overview

The Project Study Area is located in the Great Plains region of north-central Montana. The northern portion of the Project Study Area, north of Valier, is located within the glaciated high plains region of Glacier, Pondera, and Teton Counties and is largely characterized by Cretaceous formations, which have been cut and eroded by east-trending watersheds originating in the nearby Rocky Mountains. In addition, gravel from glacial deposits and river outwash occupies large areas in this region. Soils in the northern portion of the Project Study Area are typically very shallow, except on river and stream terraces. Payne (1973) characterizes vegetation in this area as “Northern Grassland.”

Gravel and cobbles deposited by the glaciers provided early inhabitants with various materials used for stone tool manufacture as well as construction materials for a variety of feature types such as stone circles (tipi rings), cairns, cairn alignments and other rock alignments. Together, these prehistoric feature types are referred to as “surface stone features.”

Much of the northern portion of the Project Study Area has been cultivated for grain production, beginning around 1890. Agricultural activities currently dominate land use in the project region with approximately 87.95 percent of the land in the Project Study Area being cropped (**See Table 4.5-1**). Cultivation has destroyed many surface stone features and shallow buried archaeological deposits where it has occurred.

The southern portion of the Project Study Area, South of Valier, is characterized by gently rolling terrain that has not been glaciated. Vegetation in this region falls within the “Teton River-Judith Basin Grassland” type (Payne 1973). The majority of this region has also been cultivated into small grain crops, which has also destroyed the majority of evidence of past societies.

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Present-day undisturbed ground within the Project Study Area can be found only in areas too rugged for cropping activities. These relatively uncommon areas primarily occur along the Marias and Teton river drainages, or relatively steep sloped coulees and buttes within the Project Study Area.

Prehistoric Overview

In 1958 William Mulloy established a comprehensive chronology for the Northwestern Plains to aid the interpretation of prehistoric sites. A modified version of Mulloy's chronology was developed by Frison in 1978 (1978; 1991). These cultural chronologies allow archaeological classification of prehistoric cultural manifestations based upon technological and temporal parameters, without respect to specific tribal affiliation. Based on these chronologies, prehistoric inhabitation of the region ranges from Clovis Paleo-Indian to the Late Prehistoric Period.

Prehistoric site types known in the region generally include surface stone feature sites (including tipi rings, cairns and alignments), lithic scatters (locations of lithic material reduction), bison kill sites, butchering/processing sites, and campsites (characterized by the presence of thermal features such as hearths and boiling pits). Rock alignments may represent a variety of functions, including animal traps or control systems, or trail markers. Rock cairns also have a variety of possible functions, including burials, trail markers and support related functions for structures or cooking and drying facilities.

At the time of Euro-American contact with Native Americans the Blackfeet tribe dominated this region. Seasonal visits by other cultural groups, primarily the Salish and Kootenai tribes, primarily to hunt bison, are also well documented.

Historic Overview

The historic period begins in this area around 1805 with the Corps of Discovery expedition. However, little physical impact from Euro-Americans occurred until the arrival of agricultural development around 1890. Homesteads were filed under the 1862 Homestead Act; the Desert Land Act of 1877 and subsequent acts. The arrival of the Great Northern Railway (24GL191, 24PN114) in 1899 was responsible for the development of the farming communities of the region. With the arrival of farming came the need for irrigation. Several historic canal systems intersect the Project Study Area. Most of the major elements of these systems have been previously recorded and evaluated as historic sites. Historic railroads, travel routes and major canals have typically been determined to be eligible for the NRHP under Criterion A, for their significant contributions to local development of agricultural and related communities.

The canals associated with the Project Study Area trace their origins to the Cary Land Act of 1894, the Montana Arid Land Act of 1895, the Federal Emergency Relief Administration (FERA), the Works Progress Administration (WPA), and various mutual irrigation associations owned by local farmers. Although many alterations have been made to these systems through maintenance and changing technology, most of these canals still follow the basic routes laid out in the late 19th and early 20th century. Previously recorded canal sites in the project area include the AN Canal (24PN109), C Canal (24PN87) and P Canal (24PN111) in Pondera County.

In the late 1920s, discovery of a rich oil field at Cut Bank led to a boom of development in that area that lasted until the 1970s. Historic-age remains of oil development likely occur within this portion of the Project Study Area.

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Paleontological Overview

Paleontological Resources have been documented in cretaceous formations throughout the region. Therefore, these resources are most likely to be discoverable in dissected lands such as coulees and major drainages.

Geologic formations found with the Study Area are depicted in **Table 4.6-21**. Geologic formations within the Study Area with potential to harbor significant fossils include the Two Medicine Formation. Other formations with low to moderate probability of harboring fossils include the Eagle, Kootenai, Madison, and Virgelle. The remaining formations or geologic types within the Study Area have little or no potential to contain fossils. Areas within the Two Medicine, Eagle, Kootenai, Madison, and Virgelle formations with potential to harbor fossils primarily occur on steep exposed slopes above major river channels.

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TABLE 4.6-21
Geologic Units in the Study Area

Geologic Unit	Acreage	Percent
Kevin Member of Marias River Formation Total	527,040.58	36.3
Two Medicine Formation Total	252,492.57	17.4
Glacial till, late Wisconsin Total	232,846.39	16.0
Telegraph Creek Formation Total	76,957.57	5.3
Ferdig Member of Marias River Formation Total	60,656.01	4.2
Glacial lake deposit Total	51,623.86	3.6
Alluvium-colluvium Total	49,283.41	3.4
Virgelle Formation Total	42,118.62	2.9
Bootlegger Member of Blackleaf Formation Total	31,003.95	2.1
Alluvium of modern channels and flood plains Total	27,496.53	1.9
Cone Member of Marias River Formation Total	23,721.35	1.6
Glacial till, older Total	19,902.21	1.4
Floweree Member of Marias River Formation Total	16,184.63	1.1
Alluvium of alluvial terrace deposits Total	12,472.93	0.9
Lake deposits Total	6,779.58	0.5
No Data - Canada	4,443.37	0.3
Taft Hill Member of Blackleaf Formation Total	4,120.66	0.3
Glacial channel deposit Total	3,515.67	0.2
Vaughn Member of Blackleaf Formation Total	2,913.63	0.2
Eolian deposit Total	2,243.23	0.2
Kootenai Formation Total	1,400.15	0.1
Alluvium of braid plains Total	1,243.40	0.1
Eagle Formation Total	1,079.01	0.1
Flood Member of Blackleaf Formation Total	263.95	0.0
Landslide deposit Total	176.76	0.0
Glacial sand and gravel deposit Total	25.81	0.0

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Baseline

In accordance with *Circular MFSA-2* the following Baseline discussion includes a description of cultural resources identified along each alternative route, including the impact zone, or APE

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[MFSA-2, 3.7.13]. *Circular MFSA-2* describes the impact zone, or APE of each alternative route as "the area where construction and operation of the facility, including access roads, may directly affect the integrity of cultural, historical, or paleontological resources and any lands with known cultural sites from which the facility would be clearly visible where the values of cultural resources may be significantly affected by the visual presence of the facility". The APE has been defined as extending 250 feet on either side of the centerline of each alternative route. Specific information provided in the following Baseline discussion includes:

- All Cultural and Paleontological Resources identified during the Class I investigation of the Class I Study Area (including the impact zone, or APE) including the number, types, and locations of all registered and eligible National Register of Historic Properties (NRHP) sites.

- *Note: Results of the Class III field investigation of the APE, including locations of new discoveries within this area, will be provided Spring 2006.*

Class I Cultural Resource Investigation

The Class I records search was conducted for the area within 1-mile of the centerline of each alternative route (Class I Study Area). The Class I Study Area therefore encompasses the impact zone, or Area of Potential Effect (APE), along each route.

The Class I records search included a review of the Montana State Historic Preservation Office (SHPO) Cultural Resources Annotated Bibliography System (CRABS) database, as well as a query of the SHPO Cultural Resources Information System (CRIS) database and the State Department of Natural Resources (DNRC) School Trust Lands Cultural Resource Dataset for specific cultural resource site locations. A review of the CRABS database provided a list of previously conducted cultural resource investigations in the general project region, while a query of both the CRIS database and the DNRC dataset provided specific locations of known cultural resource sites within the Class I Study Area, as well as the APE of each alternative route.

A more detailed description of the specific methods used to conduct the Class I cultural resource investigation are provided in the GCM Class I Cultural Resource Investigation Report found in **Appendix F**.

CRABS Search

A query of the CRABS database indicates that twelve previous cultural resource studies have been conducted in the vicinity of the Montana TIE project. Most of these have been completed over the past two decades and were associated with studies for linear projects such as utilities, petroleum pipelines, and transportation projects. Most of the past studies intersect the current study area to some degree, although none of the previous surveys substantially overlap the current project area. These reports provide examples of the types of cultural resources that can expected in the Project Study Area. A list of previously conducted cultural resource studies in the Project Study Area can be found in the reference section (Section 6.0) under Cultural Resource Investigations.

CRIS and DNRC Database Search

Figure D-9 depicts the approximate locations (sections or quarter section locations) of cultural resource sites within the three alternative routes found during the query of both the CRIS and

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DNRC databases. **Table 4.6.-22** provides a comparative summary of the number and types of cultural resources identified along each alternative route.

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TABLE 4.6-22 PREVIOUSLY RECORDED CULTURAL RESOURCE SITES WITHIN THE CLASS I STUDY AREA OF EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT				
Cultural Resource Type	**NRHP Registered/ Eligibility**	**Preferred Alternative A[1]**	**Alternative B[1]**	**Alternative C[1]**
Prehistoric Sites	Registered Sites	0	0	0
	Eligible Sites	1	1	0
	Ineligible Sites	1	1	0
	Undetermined	5	6	6
	Total	7	8	6
Historic Sites	Registered Sites	1*	1*	0
	Eligible Sites	6&	8&	4&
	Ineligible Sites	0	2	0
	Undetermined	29	34	28
	Total	35?	45	32
Total		42	53	38

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1. Cultural resource sites identified within the Class I Study area during a search of the SHPO Cultural Resources Information System (CRIS) database. Note: additional cultural resource sites within the APE of each alternative were identified during a search of the DNRC School Trust Lands Cultural Resource Database

* This registered site (site #24CA89), an historic railroad, occurs in the Class I Study Area for both Alternatives A and B. This site is located on private land in T22N, R3E, Section 2.

& Four sites are common to all three alternatives and include the following wide ranging linear features: an historic railroad/stage route (site #24GL191), an historic road/trail (site #24CA416), and two historic irrigation systems (site #24PN109 and site #24PN0111). Two additional sites are found within both the study area of Alternative A and B. These include wide ranging historic irrigation features (site # 24PN87 and site # 24PN0114). The remaining two sites are found only in the Alternative B study area and include an historic residence (site #24PN80) and an historic energy development site (site # 24PN117). These two sites are located in T30N, R4W, Section 32, and T28N, R3W, Section NW26, respectively.

The Class I Study Area of Preferred Alternative A, Alternative B, and Alternative C were found to have 42, 53 and 38 previously recorded cultural resource sites, respectively. Many of these sites are repeated in all three routes, as they overlap for purposes of the Class I study area. Surprisingly few of the sites have been formally evaluated for the NRHP.

Only one site, a railroad (Site # 24CA89), appears on the National Register. It is assumed that the 500-ft wide APE will contain substantially fewer sites than were identified in the two-mile-wide scope of the Class I study. No paleontological resources within the Class I Study Area are recorded in the CRIS or DNRC databases.

Based on the number of previous studies completed in the general region, as well as the relatively large number of records found during the CRIS and DNRC database search, the existing data are adequate for the Class I investigation. However, a Class III pedestrian survey of relevant portions of the APE (uncultivated ground and river terraces) should be conducted to identify any previously unknown cultural resources. In addition, based on a general lack of data, coulees and river terraces should also be evaluated for paleontological resources during the Class III investigation.

Paleontological Resources

Based on the alignment of each alternative route, the Preferred Alternative A would traverse the least percentage of the Two Medicine Formation (**Table 4.6-23**). Each alternative would

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traverse similar distances of the remaining formations with low to moderate potential to harbor fossils.

TABLE 4.6-23
Geologic Formations Along Each Alternative Route

Preferred Alternative A		
Geologic Unit	**Miles**	**Percent**
Glacial till, late Wisconsin Total	24.17	18.6
Two Medicine Formation Total	44.43	34.2
Kevin Member of Marias River Formation Total	26.67	20.5
Telegraph Creek Formation Total	8.33	6.4
Glacial lake deposit Total	7.72	5.9
Virgelle Formation Total	3.3	2.5
Alluvium of modern channels and flood plains Total	1.97	1.5
Alluvium-colluvium Total	1.44	1.1
Taft Hill Member of Blackleaf Formation Total	0.12	0.1
Alluvium of alluvial terrace deposits Total	1.21	0.9
Lake deposits Total	0.31	0.2
Bootlegger Member of Blackleaf Formation Total	0.26	0.2
Glacial till, older Total	1.2	0.9
Ferdig Member of Marias River Formation Total	4.7	3.6
Vaughn Member of Blackleaf Formation Total	0.04	0.0
Alluvium of Braid Plains	1.2	0.9
Cone Member of Marias River Formation	1.2	0.9

Alternative B		
Geologic Unit	**Miles**	**Percent**
Two Medicine Formation Total	44.29	35.8
Glacial till, late Wisconsin Total	33.26	26.9
Kevin Member of Marias River Formation Total	22.85	18.5
Telegraph Creek Formation Total	9.00	7.3
Glacial lake deposit Total	5.05	4.1
Virgelle Formation Total	3.30	2.7
Alluvium of modern channels and flood plains Total	2.58	2.1
Alluvium-colluvium Total	1.89	1.5
Taft Hill Member of Blackleaf Formation Total	0.42	0.3
Bootlegger Member of Blackleaf Formation Total	0.25	0.2
Lake deposits Total	0.21	0.2
Ferdig Member of Marias River Formation Total	0.19	0.2
Alluvium of alluvial terrace deposits Total	0.16	0.1
Glacial till, older Total	0.09	0.1
Landslide deposit Total	0.09	0.1
Vaughn Member of Blackleaf Formation Total	0.05	0.0

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TABLE 4.6-23
Geologic Formations Along Each Alternative Route

Alternative C		
Geologic Unit	**Miles**	**Percent**
Two Medicine Formation Total	43.51	32.3
Kevin Member of Marias River Formation Total	41.97	31.1
Glacial till, late Wisconsin Total	25.28	18.8
Telegraph Creek Formation Total	11.85	8.8
Glacial lake deposit Total	4.88	3.6
Virgelle Formation Total	2.24	1.7
Alluvium of modern channels and flood plains Total	1.47	1.1
Alluvium-colluvium Total	1.47	1.1
Taft Hill Member of Blackleaf Formation Total	0.49	0.4
Lake deposits Total	0.46	0.3
Glacial channel deposit Total	0.40	0.3
Alluvium of braid plains Total	0.23	0.2
Alluvium of alluvial terrace deposits Total	0.16	0.1
Glacial till, older Total	0.09	0.1
Eagle Formation Total	0.09	0.1
Bootlegger Member of Blackleaf Formation Total	0.08	0.1
Vaughn Member of Blackleaf Formation Total	0.07	0.1

Comparison of Western/Eastern Alternative Segments

Both the 18.5 mile Western Alternative Segment and the 18.41 mile Eastern Alternative Segment (northern portion of the Preferred Alternative A) are completely located within the Two Medicine Formation.

Environmental Consequences

A significant impact to cultural resources would occur if an archeological, paleontological, tribal, or historical value site that is listed, eligible, or potentially eligible for the NRHP is not avoided or otherwise mitigated during project construction. Therefore, project construction activities and structure placement will be done so as to avoid any physical or visual impacts to listed or potentially eligible sites identified during the Class I and Class III inventories whenever possible. When impacts are unavoidable, appropriate mitigation will be developed in consultation with SHPO and other stakeholders.

It is recommended that the listed railroad site, (Site # 24CA89), be avoided during project activities (**Table 4.6-24**). Avoidance is also recommended for the six eligible historic and one prehistoric site. Any additional sites found during the Class III pedestrian survey will be evaluated for avoidance and mitigation opportunities following the survey in Spring 2006.

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TABLE 4.6-24 CULTURAL RESOURCES POTENTIALLY AFFECTED IN THE APE* MONTANA ALBERTA TIE, LTE., LETHBRIDGE, AB – GREAT FALLS, MT		
Site Number	**NRHP Status**	**Recommendations**
24CA89	Listed	Avoidance during construction and maintenance of new line
24GL191	Eligible	Avoidance during construction and maintenance of new line
24CA416	Eligible	Avoidance during construction and maintenance of new line
24PN109	Eligible	Avoidance during construction and maintenance of new line
24PN0111	Eligible	Avoidance during construction and maintenance of new line
24PN087	Eligible	Avoidance during construction and maintenance of new line
24PN014	Eligible	Avoidance during construction and maintenance of new line

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* Any additional sites found during the Class III pedestrian survey will be evaluated for avoidance and mitigation opportunities following the survey in Spring 2006.

Results of the surveys and recommendations will be forwarded to the Montana SHPO for concurrence with eligibility recommendations and avoidance measures. Letters of concurrence from SHPO, if received, will be provided in an addendum to this application.

Appendix G specifies standards for preserving cultural resources, including discovery of unknown sites. If unknown cultural resources are discovered during construction, work within 50 feet of the site would be halted pending consultation with Montana SHPO. Any required mitigations would be developed and implemented in consultation with the appropriate agencies. Since all sites of historical value that are listed, eligible, or potentially eligible for the NRHP would be avoided or mitigated during construction, no significant impact on cultural resources in the Project Study Area would occur.

In terms of paleontological resources, potential impacts include obliteration of fossils in fossil bearing strata during tower and/or access road construction. However, fossil bearing strata primarily occurs on steep slopes with exposed soils and impacts to these areas would be avoided by spanning transmission lines over these areas.

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Types of impacts evaluated for Paleontological resources include adverse effects on a known, unique paleontological resource, and potential effects on formations with 1) high probability of fossil discovery and high paleontological importance, 2) moderate probability and moderate to high importance, and 3) low probability and moderate to high importance.

The types of possible impacts to paleontological resources would be direct and long-term in nature, and would result from ground disturbances for tower construction and new road access development. However, the potential for impacts on these types of resources is considered minimal since the probability of finding vertebrate specimens is low and transmission line construction requires only surface or near surface disturbance.

A low impact level was assigned to areas within the preferred corridor where there is potential for finding vertebrate fossils: namely, the Kootenai Formations north of Great Falls and the tertiary deposits south of Conrad. In areas where no potential exists, no impacts would occur.

As part of MATL's mitigation program, pre-construction reconnaissance will be conducted in areas where potential fossil discovery exists. If found, fossil data will be recorded by trained professionals (with landowner permission). Under these conditions, the project may result in the beneficial impact of unknown, or little studied fossils being discovered.

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4.6.8 Environmental Justice

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This section addresses Environmental Justice as required by Executive Order 12898 of February 11, 1994

Overviews

Executive Order 12898 states that all federal actions must evaluate Environmental Justice issues relative to minority populations and low-income populations. The intent of the Order is to prevent federal agency actions from disproportionately affecting minority or low-income populations with adverse health and environmental impacts. Existing laws such as NEPA provide federal agencies with a context for identifying and addressing potentially harmful impacts. The proposed project requires permits from the federal government and must therefore satisfy Executive Order 12898.

U.S. Census Bureau data from 2000 are presented by Block Group and county in **Tables 4.6-25** and **4.6-26** and throughout the text as a general description of the minority populations and low-income populations respectively within the Project Study Area. Block groups are the smallest geographic unit for which the U.S. Census Bureau tabulates sample data. In rural areas many counties are comprised of only one to three Block Groups due to low population density and similar economic and ethnic profiles. Comparing Block Group data to county and state averages allows an assessment of minority populations and low-income populations within the Project Study Area relative to surrounding conditions.

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TABLE 4.6-25
PERCENTAGE OF MINORITY PERSONS[1] BY BLOCK GROUP[2] AND COUNTY WITHIN THE PROJECT STUDY AREA COMPARED TO COUNTY AND STATE AVERAGES
MONTANA ALBERTA TIE LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

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Percent[3]	Block Group/County						State Average
	Cascade	**Choteau**	**Glacier**	**Pondera**	**Teton**	**Toole**	
Block Group(s)	8.4	2.1	15.4	3.9 & 5.7	1.6 & 3.7	6.6	10.5
County Average	10.5	16.1	64.7	16.8	4.4	6.7	

[1]A minority person is one who is not "white alone" as defined by the U.S. Census Bureau.
[2]"Block group" is the smallest geographic unit for which the U.S. Census Bureau tabulates sample data. The Project Study Area encompasses more than one block group in some counties.
[3]Source: U.S. Census Bureau, 2000 http://factfinder.census.gov.

TABLE 4.6-26
PERCENTAGE OF PERSONS BELOW POVERTY LINE BY BLOCK GROUP[1] AND COUNTY WITHIN THE PROJECT STUDY AREA COMPARED TO COUNTY AND STATE AVERAGES
MONTANA ALBERTA TIE LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

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Percent[2]	Block Group/County						State Average
	Cascade	**Choteau**	**Glacier**	**Pondera**	**Teton**	**Toole**	
Block Group(s)	11.4	14.8	19.8	9.6 & 39.9	10.2, 12.5	22.2	14.6
County Average	13.5	20.5	27.3	18.8	16.6	12.9	

[1]"Block group" is the smallest geographic unit for which the U.S. Census Bureau tabulates sample data. The Project Study Area encompasses more than one block group in some counties.
[2]Source: U.S. Census Bureau, 2000, http://factfinder.census.gov.

No specific minority or low-income populations are crossed within the Project Study Area. Block group data do show some portions of two counties (Pondera and Toole counties) with higher than county average poverty rates. In Pondera County, this high average is due to

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demographics within the community of Heart Butte which is located several miles west of the Project Study Area. Unemployment in Heart Butte and the immediate surrounding area is 36.6 percent and the number of persons living below the poverty level is 43.6 percent. Unemployment in the remainder of the county is at or below 7.7 percent although poverty levels remain relatively high (24.9 percent) in the rural areas around Dupuyer and Valier due to a low-income job base.

Similarly, poverty levels in western Toole County are relatively high (22.2 percent) but again are not related to a specific community. The total population of the western part of Toole County in 2000 was approximately 900 people. Unemployment in all of Toole County is less than 7.3 percent but per capita income in western Toole County is $13,664.

Baseline

Due to the dispersed, rural nature of the Project Study Area and the overlapping study corridors among the three routes, demographics among the three alternatives are very similar. Alternative C does leave Alternatives A and B when it is routed east near Antelope Flats north of Benton Lakes NWR. However, demographics between Alternative C and Alternatives A and B at this point remain similar. Alternative C extends into the western portion of Choteau County where the poverty level is 14.8 percent compared to Alternatives A and B in eastern Teton County where the poverty level is at or below 13.8 percent. All three alternatives then enter Cascade County within the same Block Group where the poverty level is 13.4 percent. Minority populations are also limited in these areas. The percentage of minority persons varies from approximately three to eight percent within these portions of the three alternative corridors.

Environmental Consequences

As previously mentioned, the dispersed rural nature of the Project Study Area and the overlapping study corridors result in no substantial differences among the three alternatives relative to income or minority status. Environmental Consequences are discussed relative to the Project Study Area and not individual routes.

The EPA has developed guidelines for evaluating when Environmental Justice impacts disproportionately affect minority or low-income populations. These impacts would include significant (as employed by NEPA) effects to ecological, cultural, human health, economic, or social impacts to minority of low-income communities that appreciably exceed those on the general population or relevant comparison group (EPA 2003). In addition, Environmental Justice also addresses impacts to Native American culturally or religiously significant sites (EPA 1998).

Significant impacts for this project are assessed relative to three criteria:

Criteria 1: an alternative is sited to disproportionately negatively affect low-income or minority populations;
Criteria 2: an alternative disproportionately reduces the ability of low-income or minority persons to make a living;
Criteria 3: Native American cultural or religious sites are irreparably damaged or destroyed.

Criteria 1: Ethnic and economic demographics are relatively similar among the routes and between all of the routes and the surrounding comparison communities with the exception of the Blackfeet Reservation to the west of the Project Study Area. The percentage of Native

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Americans on the Blackfeet Reservation and the poverty level are much higher than in the general comparison region. In addition, some specific low-income and minority communities do exist within the general region (e.g. Heart Butte) but are not within the Project Study Area boundaries. High poverty levels in other parts of the Project Study Area such as western Toole County are not related to specific communities but rather to generally low-paying jobs in a dispersed rural environment. None of the alternatives negatively affect low-income and/or minority populations in a disproportionate manner to the surrounding communities or region; consequently there is no significant impact relative Criteria 1.

Criteria 2: Employment in the Project Study Area is related to dispersed activities such as farming, ranching, or commuting to jobs in surrounding towns and cities. Construction of the powerline could result in short-term employment opportunities for the local workforce. There are no unmitigable effects to wildlife which could serve as an economic base for some persons within the local workforce. None of the alternatives have a significant negative impact on the economic livelihood of local populations and none would disproportionately reduce the ability of low-income or minority persons to make a living, resulting in no significant impact relative to Criteria 2.

Criteria 3: MATL has consulted and will continue to consult with Native American tribal members regarding cultural and religious sites within the Project Study Area. Due to MATL's avoidance and mitigation of impacts to cultural resources there is no significant impact relative to Criteria 3.

4.7 Cumulative Effects

Cumulative effects could result from the Proposed Action's impacts combined with impacts from other past, present, and/or reasonably foreseeable future actions within the Project Study Area. Impacts would be considered significant if the combination of the Proposed Action and other actions in the Project Study Area resulted in significant impacts for any of the resource areas described in this application.

4.7.1 Past and Present

Past impacts within the Project Study Area include direct and indirect effects from linear facilities such as roads, transmission lines, and pipelines as well as dispersed impacts from isolated projects such as gravel pits and borrow sites. Present impacts are similar with past impacts as they are the current results of past projects and actions.

Impacts from these types of actions include: 1) the movement of noxious weeds along linear facilities into uninfested areas; 2) wildlife mortality from collisions with vehicles or transmission lines; 3) fragmentation of wildlife habitat; 4) degradation of unique characteristics of the geographic area such as historic trails, rivers, wetlands, or other ecologically critical areas.

Measures specified in **Table 5.3-1** outline efforts MATL will make to avoid or mitigate the effects of the Project's construction, operation, and maintenance. These measures will help prevent the additive impacts that would occur from the combination of the Proposed Action with the other existing actions in the area. The measures and permitting process will also ensure that the Proposed Action does not violate federal, state, or local laws protecting the environment.

Specifically, the Proposed Action would not result in increased risks or highly controversial effects to the human environment (see *Section 4.6*). Further, given the existence of powerlines and other utility facilities in the Project Study Area, the Proposed Action would not create a

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precedent for future actions that are highly controversial, highly uncertain, or involve unique risks to the human environment. Finally, the Proposed Action would not result in significant impacts to federally listed species, critical wildlife habitat, wetlands, or unique natural features (see *Section 4.5*).

4.7.2 Reasonably Foreseeable Future

Actions within the reasonably foreseeable future that could occur in the Project Study Area include the development of irrigation systems, wind farms, and pipelines delivering petroleum products from Canada to markets within the United States.

Three reserved water use rights are known to occur within the Project Study Area including two water use rights northeast of Lake Frances in Pondera County (#271 and #411) that are within the corridors of Alternatives A & B; and one water use right southwest of Antelope Flat in Chouteau County (#FG-641) within the Alternative C corridor (Montana DNRC No Date). Consultation between the water use right holder and the MATL should occur if these rights are to be developed to avoid conflicting land uses.

Cumulative impacts resulting from future wind farms or pipelines within the Project Study Area could include increased bird and/or bat mortality from wind turbines and the increased dispersion of noxious weeds along pipeline right-of-ways. Bird collision impacts are expected to be minimized or avoided for this Project through the use of bird flight diverters, thus reducing the potential for cumulative effects on bird mortality. Noxious weeds must be controlled on linear facilities per the Montana County Noxious Weed Act. MATL will prepare noxious weed management plans for each affected county to be reviewed, approved and signed by the chairman of the weed board. Similar plans would be submitted for future facilities and would include noxious weed mitigation measures. Together, these plans would reduce the potential for cumulative impacts from noxious weeds below the significance level.

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Overview Mapping and Criteria

Overview Survey refers to data collection and mapping of specific resources within the Project Study Area for the purpose of identifying alternative locations suitable for siting MATL's proposed Project. The Circular MFSA-2 clearly indicates Overview requisites including map presentation of required criteria, disclosure of resources or methods used to evaluate those criteria, and conclusions resulting in selection of alternative facility locations.

MATL developed a two-map set (north and south half) of Overview base maps and resource overlays to meet Circular MFSA-2 Overview Survey requirements [Circular MFSA-2, 3.3.3]. These Overview base maps and resource overlays are presented at a scale of 1:100,000 on a USGS topographic base; show township, range, and section lines; depict the proposed Project alternatives within the Project Study Area; are provided both electronically and on mylar; and are accompanied by supporting metadata. All Overview base maps and resource overlays are included in ***Appendix D*** *to this application.*

Overview criteria are provided in ***Table 2-1*** *and are denoted with an "O" in the far left-hand column of that table. Based on general guidance for conducting Overview surveys provided in Section 3.3 of Circular MFSA-2, it is our understanding that Overview criteria are intended to guide the transmission line route selection process through avoidance of significant land use features, and important and/or sensitive physical, biological, and cultural resources.*

4.2 Baseline Mapping and Criteria

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Baseline Impact Assessment refers to a more detailed analysis that forms the scientific and analytic basis for the comparison of alternatives. Direct, indirect, and cumulative effects associated with project alternatives are evaluated on a resource-by-resource basis to meet the Baseline objective of identifying a Preferred Alternative.

MATL developed a 14-map set of Baseline base maps and resource overlays to meet *Circular MFSA-2* requirements [Circular MFSA-2, 3.6.2 and 3.6.3]. These maps and overlays are presented at a scale of 1:24,000 on a USGS topographic base; show township, range, and section lines; display county, state, and interstate roadways; and show Project alternatives in detail. MATL has provided these to MDEQ in both electronic and hard copy (mylar) format along with supporting metadata. All Baseline base maps and resource overlays are included in **Appendix E** to this application.

Baseline criteria are provided in **Table 2-1** and are denoted with a "B" in the far left-hand column of that table. Although sometimes redundant with Overview criteria, the intent of the Baseline Impact Assessment is to evaluate these criteria at a greater level of detail (relative to each alternative route) than previously completed so that a preferred transmission line route can be selected from the three proposed alternatives.

Specific criteria are identified in *Circular MFSA-2* Section 3.7. However, several additional general Baseline requirements intended to support those detailed assessments are provided in *Section 3.6* and include the following:

[Section 3.6.4]

Aerial photograph color contact prints providing complete physical aerial coverage of the alternative facility location meeting foliage and time requirements and used to conduct land use assessments. Provided in **Appendix F**.

Black and white stereo-aerial coverage for areas prone to mass movement and used to evaluate potential slope stability concerns along route alternatives. Provided in **Appendix F**.

[Section 3.6.5]

Information sufficient to determine compliance with all standards, permit requirements, and implementation plans administered by MDEQ. Supporting permits are identified in **Table 1-2**. Construction standards and plans along MATL commitments discussed in *Section 6.0 Environmental Monitoring and Follow-up Programs*

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[Section 3.6.7]

Identification and discussion of potential mitigations or environmental protection measures as appropriate including those associated with construction, maintenance, and operation of the proposed facility. Proposed measures are identified on a resource-by-resource basis in individual *Environmental Consequences* discussions, and a summary provided in *SubSection 5.3 Environmental Protection Measures.*

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Montana Alberta Tie Ltd. (MATL) has developed three (3) 230-kV transmission line route alternatives for consideration in its MFSA application to MDEQ, and Presidential Permit Application to the U.S. Department of Energy (DOE). These alternative routes are the southern extension of MATL's overall proposed project that originates in Lethbridge, Alberta and traverses south/southeast to its southern terminus near Great Falls, Montana.

The three route alternatives (Preferred A, Alternative B, and Alternative C) cross the U.S./Canada border approximately 26 miles almost directly north of Cut Bank, Montana and run parallel south to a location approximately 2 miles north of Cut Bank where they converge to skirt the community to the east and south. At the Glacier Electric Cooperative substation, located approximately 1 mile west of Cut Bank, the alternatives diverge traveling over roughly parallel routes east of the Blackfeet Indian Reservation along a southeastward trend. Routes A and B roughly parallel NorthWestern Energy's (NWE) southeastward trending 115-kV line along its entire distance to its tie-in to NWE's 230-kV substation north of Great Falls. Alternative C traverses to the east away from routes A and B at a location approximately 9 miles southeast of Brady, Montana and approximately 5 miles north of the Teton River. Alternative C jogs directly east and south to take advantage of existing north-south and east-west state highway and county road rights-of-way enroute to NWE's 230-kV substation. Major river crossings include the Marias River, approximately 10 miles south of Cut Bank, and the Teton River, approximately 14 miles south of Brady, Montana. Although several state highways are crossed by the three alternatives, only one crossing of Interstate Highway 15 occurs along each of Preferred A, Alternative B, and Alternative C. Detailed discussions of resources encountered and/or potentially affected along each of the three alternatives are provided in the following sections of the application. Finally, in accordance with the route selection process established in *Circular MFSA-2*, the application rationalizes the selection of the Preferred Alternative through alternative comparison/ranking.

No Action

Under the no action alternative, the proposed Project would not be implemented. Existing electrical transmission service in southern Alberta and north-central Montana would be maintained and operated at its current level. In addition, development of potential sustainable generation resources would likely not occur.

Alternatives Considered But Dismissed From Detailed Study

As previously indicated in *Section 2.0*, during the conceptual phase of the proposed Project, MATL considered several alternative routes for the proposed transmission line between Lethbridge, Alberta, and Great Falls, Montana. The alternatives briefly described herein, were dismissed by MATL for further consideration based on numerous factors associated with feasibility and constructability of the proposed Project. **Figure 4-1** depicts these dismissed alternatives.

Northwest Alternatives

Route selection from the U.S./Canada border to Cut Bank 25 miles south required MATL to consider several alternatives. The border crossing location directly north of Cut Bank is largely driven by routing in southern Alberta. Routing in this area follows the west edge of protected lands in the Milk River Hills, one of the largest contiguous grasslands in Canada. MATL discarded several alternatives in this area, except the three presented in this document, based on land use criteria such as: avoidance of occupied residences, an abundance of prairie pothole wetlands, and avoidance of Blackfeet Reservation land.

Eastern Alternative

MATL conceptually considered a Canada/U.S. border crossing near the Coutts/Sweet Grass Port-of-Entry along U.S. Interstate Highway 15 (I-15). Route alternatives considered in this vicinity would parallel Highway 4 from Lethbridge to Coutts/Sweet Grass, and roughly follow I-15 from the border south to Shelby. This alignment would have afforded the project an opportunity to maintain infrastructure development in a common corridor, and as well as avoiding protected lands in the Milk River Hills of southern Alberta.
Figure 4-1

Page Break

South of Shelby, the eastern alternative would have travelled diagonally cross-country to the southeast for a distance of approximately 12 miles before heading directly south for almost the entire remaining distance to its tie-in at NWE's 230-kV substation north of Great Falls. Several factors contributed to MATL's dismissal of the eastern alternative including:

In southern Alberta, the proposed Project would potentially compromise the safety control system on the rail line that parallels Highway 4.

Land development patterns in southern Alberta, and in the Shelby area would necessitate the use of a stairstep-like centerline resulting in increased distances, and numerous guy wire locations because of deflection angles exceeding one degree.

The topographically rugged “breaks” of the Marias River occur approximately 6 miles south of Shelby. The steep and highly eroded topography at this crossing location is relatively wide (approximately 6 to 7 miles) and would result in additional project costs to meet engineering challenges.

The Marias River breaks area is relatively undisturbed which presents the potential for a greater number of archaeological sites.

The Bureau of Land Management (BLM) administers a great share of the Marias River breaks and surrounding area.

Cut Bank to Shelby Alternative

MATL considered a cross-country northwest/southeast trending route alternative between Cut Bank and Shelby. This approximately 28-mile alternative presented difficulties because of its diagonal traverse of land developed for agricultural use (predominantly dry-land cereal cropland) on a north/south – east/west grid pattern. Development of this alternative would require a stairstep-like alignment with numerous guy wire structures. In addition, this alternative would present the same difficulties south of Shelby as those associated with the *Eastern Alternative*. As a result, MATL discarded the Cut Bank to Shelby Alternative because of increased engineering requirements and land requirements resulting in elevated project costs in comparison to other potential alternatives.

NWE 115-kV Transmission Line Rebuild Alternative

Consolidation of utility corridors and actual facilities would minimize potential environmental impacts resulting from a greenfields project. With that impetus, MATL considered rebuilding and updating as necessary NWE’s existing 115-kV transmission line between Cut Bank and Great Falls and engaged in confidential discussions with NWE to that end. This option proved prohibitive based on the logistics of maintaining service, and the economics associated with a partnership and existing line rebuild. Ultimately though, consideration of this alternative resulted in alternatives roughly paralleling NWE’s existing line that MATL has carried for further consideration in this proposal (Preferred A and Alternative B).

Land Requirements

Resource-by-resource assessments of potential impacts consider land requirements that are dependent on MATL’s project design and construction practices that would be implemented for the proposed Project. As a basis for individual resource discussions that identify potential *Environmental Consequences* and associated mitigations to minimize or eliminate those consequences, brief discussions are provided of basic project components that could result in potential disturbance. These include right-of-way requirements including safety and operation zones, access roads, staging areas, and basic project components. Table 4-1 provides a summary of anticipated land requirements associated with each of these project components on an alternative route basis. Design, construction, and implementation of these components are discussed in detail in *Section 5.2 System Design and Implementation*.

4.3.4a Right-Of-Way (RoW)

MATL developed RoW widths for the proposed Project based on structure type, location, proven construction methods, and safety and operations zones. Power line easement requirements are dependent on structure widths. The Project would predominantly employ the use of H-frame structures with three-pole structures used at medium and heavy angles, and dead ends. When angle-bracing wires are used, additional easement space would be required. All angle structures at deflection points are subject to guy wire bracing. All are essential to the Project and are used to address the topography the line is crossing and/or land use practices in the Project Study Area.

The proposed Project would have a left and right side safety and operations zone. The width of this zone is based on safety considerations associated with line to ground short-circuiting, and operations land access needs for line repairs and maintenance activities of the power line. In some situations, the safety zones are also designed to address high wind speeds, which can cause the line to swing away from structures, thus increasing the width of the safety zone.

4.3.4b Access Roads

As a result of relatively flat topography and associated agricultural land uses that predominate in the Project Study Area, MATL anticipates only minimum development of access roads to construct, operate, and maintain the proposed Project. The majority of the Project RoW would be easily accessed from public roads, existing two-track routes, and farm fields allowing truck and equipment travel along the RoW. MATL does not anticipate maintenance of these access points with the exception of gate installations at key locations if necessary. Disturbances resulting from access requirements would be reclaimed to conditions similar to what existed pre-project or to those conditions specified by landowners during easement-lease negotiations. Obstacles to travel along the RoW would potentially include:

Slopes greater than 5 percent forcing the contractor to consturct temporary access roads.
Coulees or intermittent stream channels.
Live streams, rivers, or other wetland areas.
Areas determined to exhibit reclamation constraints because of highly erodible soils.
Areas determined to provide habitat to sensitive wildlife or plant species.
Pipelines, railroad tracks, irrigation ditches, or other linear features.
Heritage or archeological sites.

Specific areas along route alternatives identified as posing difficult access include sites near the Marias and Teton river crossings. Grading and recontouring may be required in these potentially difficult construction sites to gain access to reinforced structures that would support wire spans of these crossings. However, MATL anticipates thorough restoration efforts in coordination with landowners and appropriate agencies. MATL expects that other specific sites would be identified and addressed in subsequent reclamation plans as system design and associated access planning proceeds.

4.3.4c Construction Staging Areas

Construction staging areas would be located in previously disturbed areas such as rail yards, siding areas, construction yards and fallow lots whenever possible. Some construction staging areas may be located in undisturbed greenfields when disturbed sites are not available. In general, construction staging areas would be located in communities near the right-of-way where rail and truck service are available or in rural areas where equipment could be unloaded from tractor-trailers. In all cases, construction staging areas would be located on private land and would be subject to landowner negotiations and agreements.

Regardless of the alternative route, construction staging areas would likely be located in the following communities at practicable sites:

Cut Bank
Valier
Conrad
Brady
Dutton
Great Falls

Construction staging areas (or marshaling yards) in these communities would be primary sites for unloading equipment and materials for construction. Each site would likely be between two and three acres.

Smaller construction staging areas would be located in rural areas and may be in undisturbed greenfields. In general, these smaller sites would occur approximately every 20 miles along the alternative routes and would average less than one acre in size. However, due to the frequency of communities within the Project Study Area, few smaller construction staging areas would be needed. Currently, the only potential locations occur on Alternative C at two sites:

North of the Teton River near West Knob;
South of the Teton River between Benton Lake NWR and Antelope Flat.

Assuming that the construction staging areas located in the above communities are common to each alternative, the total approximate acreage that would be disturbed due to these sites is listed below:

Alternative A: 15 acres;
Alternative B: 15 acres;
Alternative C: 17 acres.

Based upon construction requirements for structures, access roads, and staging areas, a summary of the approximate land requirements and acreage needs for each alternative is presented below in **Table 4.3-1**.

TABLE 4.3-1 SUMMARY OF ANTICIPATED LAND REQUIREMENTS MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
Component	**Number**	**Width or Area Construction/Operational**	**Total Acreage**
Preferred A (Approx. length = 127 mi.)			
H-frame	701	75 ft^2 (0.13 acres)	91.1
H-frame light angle	15	100 ft^2 (0.23 acres)	3.5
3-pole medium to heavy angle	46	120 ft^2 (0.33 acres)	15.2
3-pole dead end	10	120 ft^2 (0.33 acres)	3.3
Greenfield staging areas	6	2.5 acres	15.0
Access road total area	--	14 feet wide	217.1
Approximate Total Acreage Preferred Alternative A			345.2
Alternative B (Approx. length = 124 mi.)			
H-frame	682	75 ft^2 (0.13 acres)	88.7
H-frame light angle	24	100 ft^2 (0.23 acres)	5.5
H-frame medium to heavy angle	32	120 ft^2 (0.33 acres)	10.7
H-frame dead end	6	120 ft^2 (0.33 acres)	2.0
Greenfield staging areas	6	2.5 acres	15.0
Access road total area	--	14 feet wide	209.9
Approximate Total Acreage Alternative B			331.8
Alternative C (Approx. length = 135 mi.)			
H-frame	771	75 ft^2 (0.13 acres)	100.2
H-frame light angle	14	100 ft^2 (0.23 acres)	3.2
H-frame medium to heavy angle	14	120 ft^2 (0.33 acres)	4.6
H-frame dead end	11	120 ft^2 (0.33 acres)	3.6
Greenfield staging areas	8	2.5 acres	20.0
Access road total area	--	14 feet wide	228.7
Approximate Total Acreage Alternative C			360.3

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C	113.27	22.25	.97	136.49

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TABLE 4.5-5 LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT						
Land Cover Type[1]	**Preferred Alternative A**		**Alternative B**		**Alternative C**	
	Length (miles):	**Percent:**	**Length (miles):**	**Percent:**	**Length (miles):**	**Percent:**
Low/Moderate Cover Grasslands	47.83	36.5	40.32	32.4	39.68	29.1
Agricultural Lands - Irrigated	37.62	28.7	38.21	30.7	40.17	29.4
Agricultural Lands - Dry	31.20	23.8	35.71	28.7	40.47	29.7

TABLE 4.5-5 LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT						
Land Cover Type[1]	**Preferred Alternative A**		**Alternative B**		**Alternative C**	
	Length (miles):	**Percent:**	**Length (miles):**	**Percent:**	**Length (miles):**	**Percent:**
Altered Herbaceous	4.97	3.8	2.45	2	6.54	4.8
Moderate/High Cover Grasslands	2.86	2.2	1.03	0.8	1.74	1.3
Very Low Cover Grasslands	2.76	2.1	2.55	2	2.43	1.8
Rock	1.03	0.8	0.9	0.7	0.9	0.7
Graminoid and Forb Riparian	0.82	0.6	1.28	1	1.32	1
Ponderosa Pine	0.60	0.5	.59	0.5	1	0.7
Shrub Riparian	0.51	0.4	.11	0.1	0.22	0.2
Rocky Mountain Juniper	0.39	0.3	0.2	0.2	0	0.0
Mixed Mesic Shrubs	0.19	0.1	0.29	0.2	0.75	0.6
Mixed Barren Sites	0.12	0.1	0.21	0.2	0.06	0.0
Mixed Xeric Forest	0.08	0.1	0.17	0.1	0.17	0.1
Mixed Broadleaf Forest	0.06	0.0	0.04	0.0	0.26	0.2
Conifer Riparian	0.04	0.0	0.38	0.3	0.47	0.3
Salt-Desert Shrub/Dry Salt Fla	0.03	0.0	0.0	0.0	0.17	0.1
Water	0.0	0.0	0.0	0.0	0.04	0.0
Broadleaf Riparian	0.0	0.0	0.0	0.0	0.1	0.1

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

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Pearsons Coulee:	7.52 and 7.65 miles
PEMC/PUSA Wetlands	.26 miles
Old Maids Coulee	10.38, 10.21, and 10.04 miles
Marias River	170.51 miles
Bullhead Creek	9.93 miles
Winginaw Coulee	0.21 miles
Schultz Creek	21.68 miles
Dry Fork Marias River	27.44 miles
Spring Creek	4.09 miles
PEMC Wetlands	.14 miles
Pondera Coulee	96.79 miles
Railroad Coulee	3.73 miles
South Pondera Coulee	16.81 miles
Brady Coulee	3.84 miles
Rocky Coulee	16.14 miles
Teton River	94.45 miles

Hunt Coulee	1.37 miles
Kinley Coulee	5.30 miles
Unnamed	0.68 miles
Timber Coulee	9.21miles
Rye Coulee	6.98 miles
Sheep Coulee	13.07 miles
Huntley Coulee	25.20 miles
PEMAd Wetlands off Black Horse Lake	.02 miles
Black Horse Lake Flat	0.03 miles

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Preferred Alternative A would cross the Marias River east of the existing NWE 115-kV transmission line. The Marias River at this crossing location is broad with a narrow to wide band (approximately 20 feet to up to 50 feet wide) of herbaceous/shrub riparian vegetation. Mature riparian forest with stands of cottonwood occurs within the 1-mile impact zone on both the west and east sides of the crossing. These stands are greater than 300 feet long and 30 feet wide with an average canopy height of 50 feet or more and average density of mature trees greater than 20 stems per acre [MFSA-2 3.7.12.b.xxi]. Cottonwood trees and willows grow along Two Medicine River, but do not extend as far east as GAP data predicts.

South of the Marias River, Preferred Alternative A crosses the western edge of the area known as Willow Rounds. The dominant grass community here is grama-needlegrass. South of Willow Rounds, the route traverses farmland and then crosses Bullhead Creek east of Bullhead Lake. At this crossing, the drainage is narrow (less than 20 feet) supporting primarily herbaceous (*Carex* spp. and *Juncus* spp.) and some shrub riparian vegetation. The route would traverse farmland in between the next two coulees to the south, Winginaw Coulee and then Ringwald Coulee. Both of these drainages were dry at the time of the field survey (July 2005) and supported no riparian vegetation.

Preferred Alternative A crosses the Dry Fork Marias River northwest of the town of Conrad. The Dry Fork crossing is relatively narrow (approximately 20 feet) supporting primarily herbaceous and shrub riparian vegetation. South of the Dry Fork Marias River, the route crosses McLean State Game Preserve. The dominant vegetation community within the McLean State Game Preserve is wheatgrass and alfalfa; however, a portion of the Preserve is cultivated for wheat. South of the Game Preserve, the route would extend south and then southeastward traversing farmland west of Conrad.

South of Conrad, Preferred Alternative A would cross Pondera Coulee. One-quarter mile north of the Pondera/Teton County line, Preferred Alternative A would extend approximately 1 mile eastward and then extend southeastward traversing cropland before spanning the Teton River approximately 2 miles west of Kerr Bridge (20th Lane). The area where the line would span the river is a quarter-mile gap in the riparian cottonwood forest.

After spanning the Teton River, Preferred Alternative A would traverse across approximately 1 mile of rangeland dominated by a grama-needlegrass community and then cross Hunt Coulee. Hunt Coulee is a steep yet narrow drainage the sides of which are dominated by western snowberry, Wood's rose, and silver sagebrush-western wheatgrass communities. Southeast of Hunt Coulee, Preferred Alternative A would traverse farmland and the following coulees (from north to south): Kinley, Unnamed, Timber, Rye, and Sheep. All of the aforementioned coulees are relatively narrow (less than 20 feet) and support little to no riparian vegetation. After crossing Sheep Coulee, Preferred Alternative A would continue extending southeast across farmland.

Preferred Alternative A would traverse the area approximately 1 mile east of the eastern boundary of the USFWS Benton Lake National Wildlife Refuge. The vegetation within the eastern boundary of the Refuge consists of needlegrass and wheatgrass; however, outside the Refuge boundary, where the route would extend is dry cropland. At this point the route extends due south crossing through a low point in the bluffs above Black Horse Lake Flat. This area is dominated by dry cropland interspersed with some pasture. From here the route would extend southward crossing dry cropland until it ties in with NWE's 230-kV Substation north of Great Falls.

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TABLE 4.6-7
LINEAR MILES OF FARMLAND AND NON-FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover[1]	Preferred A	Alternative B	Alternative C
Irrigated Farmland	.11 (0.1%)	1.60 (1.3%)	2.00 (1.5%)
Non-Irrigated Farmland	86.43 (65.9%)	88.02 (70.7%)	93.43 (68.5%)
Non-Farmland	44.58 (34.0%)	34.81 (28.0%)	41.06 (30.0%)
Total	131.12	124.43	136.49

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TABLE 4.6-8
LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE
MONTANA ALBERTA TIE LTD.

Land Cover Type[1]	Preferred Alternative A		Alternative B		Alternative C	
	Length (miles):	Percent:	Length (miles):	Percent:	Length (miles):	Percent:
Water/Wetland	1.04	2.3%	.26	0.8%	.17	.4%
Riparian	2.57	5.8%	1.98	5.8%	1.96	4.8%
Forest	.04	0.0%	.09	0.0%	.27	.7%
Open/Grassland	40.93	91.9%	32.48	93.4%	38.66	94.1%

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TABLE 4.6-17 AUDIBLE NOISE (AN) EFFECT MONTANA ALBERTA TIE, LTD. LETHBRIDGE, AB – GREAT FALLS, MT		
Pole Type	**Distance from Centerline (feet)**	**Audible Noise (dBA) (L_{50})**
H-frame Double Pole	100	46.23
	52.33	49.56

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TABLE 4.6-18 RADIO INTERFERENCE (RI) AND TELEVISION INTERFENCE (TVI) EFFECT MONTANA ALBERTA TIE, LTD. LETHBRIDGE, AB – GREAT FALLS, MT				
Pole Type	**Distance from Center Line (feet)**	**Radio/Television**	**Frequency (MHz)**	**Interference (dBuV/m) (L_{50})**
H-frame Double Pole	120 (100 ft from outside conductor)	RI	0.5	33.7
			0.834	30.2
			1	28.7
			1.25	26.7
			1.5	24.9
			2	21.8
		TVI	75	19.8

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5.0 ALTERNATIVES SELECTION [Circular MFSA-2 3.9 and 3.10]

Sections 3.9 and 3.10 of Circular MFSA-2 require MATL to compare alternative facility locations with consideration given to the resources discussed herein, and additional attention given to the economics, engineering, and reliability of the proposed Project. Based on resource-by-resource assessments, and stakeholder consultation, MATL has attempted to weigh what have surfaced as the most important factors for consideration in its comparison of alternatives, and supportive argument in favor of the Preferred Alternative A.

5.1 Alternatives Comparison/Ranking and Preferred Alternative Selection

As part of project development, the three alternative routes were compared to each other to assess relative impacts. Within each resource area impacts were assessed for major categories. For example, noxious weeds, native grasslands, and riparian communities are the major categories of environmental consequence within the Vegetation Resource Area; consequently, each of these categories was assessed for impacts when comparing the three alternatives. The most important impacts relate to mechanical irrigation systems. MATL has reviewed each of the three routes to be sure to avoid these systems when possible. If these systems are unavoidable, MATL will negotiate with the affected landowner(s) or try to use single-pole structures to reduce or avoid impacts.

Impacts were assigned a ranking of five for most important to one for least important. As part of the ranking system, MATL considered impacts that are unmitigable and/or permanent as the most important and ranked these impacts as a four or five, depending on the extent of relative impact. Impacts that are either mitigable and/or short-term are considered less damaging and are ranked a two or three depending on the extent of relative impact. Impacts that are considered ephemeral or have no impact are ranked a one. Impacts that have a beneficial effect upon a resource are ranked a zero. Summing the impact rankings by alternative provides an unbiased comparison among alternatives, as a higher total number indicates a higher total impact.

Finally, primary resources are weighted to increase their significance in the ranking process. Following consultation with the MDEQ, the USFWS, the Blackfeet Nation, and local county agencies, the primary resources identified for this project are:

- Land Use (primarily irrigated agricultural land);
- Cultural Resources;
- Noxious Weeds; and,
- Migratory Birds.

Each of these resource areas is weighted by a factor of two to double their importance in the alternatives comparison process. The three alternatives are ranked below in **Table 5.1-1** by impacts within each resource area.

In addition to environmental resources, other issues were considered such as project design, construction characteristics, cost, operations and maintenance. In particular, items such as the number of deflection points and the number of structures can affect the project's impact on the landscape, construction costs, and maintenance requirements. Deflection points require guy wires that necessitate additional area and make farming activities more cumbersome. A greater total project length requires more wire, structures, and other material and contributes to greater maintenance requirements and potentially less reliability.

These design and maintenance issues are also presented in **Table 5.1-1**. However, the ranking system differs from the environmental resources section since there are inherently different considerations in design and maintenance compared with environmental resources. Issues under the design and maintenance section of **Table 5.1-1** are ranked a three for those that are most cumbersome or require the most maintenance and are therefore potentially the least reliable. Issues are ranked a two if they create less of a nuisance or maintenance problem than items ranked a three. Issues are ranked a one if they represent the most efficient and reliable option for project design and maintenance.

TABLE 5.1-1
IMPACT RANKING BY ALTERNATIVE ROUTE
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Environmental Resources			
Resource Area	**Alternative A**	**Alternative B**	**Alternative C**
Geology & Soil • Highly erodible soils • Steep slopes	 2 2	 2 2	 2 2
Air • Fugitive dust	1	1	1
Water • Floodplains • Streams/river crossing	 2 2	 2 2	 2 2
Vegetation • Noxious weeds (x2) • Native grasslands • Wetlands and Riparian areas	 4 2 2	 4 2 2	 4 2 2
Wildlife • Migratory birds (x2)	 4	 4	 4
Threatened, Endangered, Sensitive Species	1	1	1
Socioeconomics • Short-term employment • Tax base	 0 0	 0 0	 0 0
Land Use • Irrigated farmland (x2) • Non-irrigated farmland	 4 2	 6 2	 6 2
Utilities and Transportation	2	2	2
Visual Resources • Extent of visual impacts	 4	 5	 5
Human Health and Environment • Exposure to EMF • Electrocution	 1 1	 1 1	 1 1
Recreation • Decrease hunting opportunities • Change recreational access	 1 1	 1 1	 1 1
Cultural Resources (x2) • Effects to eligible NRHP sites • Effects to paleo resources	 4 4	 4 4	 4 4
Environmental Justice • Disproportionately affect low-income or minority populations	 1	 1	 1
Cumulative Impacts • Create a precedent for future projects • Significant impacts to listed species, wetlands, unique features	 1 1	 1 1	 1 1
Total Environmental Resources Ranking	49	52	52
Design and Maintenance			
Design and Maintenance Issue	**Alternative A**	**Alternative B**	**Alternative C**
Length (miles)	2	2	3
Deflection Points	2	2	3
Accessibility	1	1	3
Greenfield Staging Areas	1	1	3
Access Roads	1	1	3
Maintenance Costs	1	2	3
Total Design and Maintenance Ranking	8	9	18

TABLE 5.1-1 IMPACT RANKING BY ALTERNATIVE ROUTE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
Environmental Resources			
Resource Area	**Alternative A**	**Alternative B**	**Alternative C**
Grand Total Ranking	**57**	**61**	**70**

In addition to rankings provided in **Table 5.1-1**, the section below more fully addresses the required discussion of the specific categories identified in **Circular MFSA-2 Section 3.9.1(c)(i-xii)**:

i. Levelized Costs: Given the similarity of terrain and land use that each of alternatives crosses, MATL is not aware of any material difference that would affect levelized costs.

ii. Reliability: All alternatives are subject to same weather patterns, therefore reliability based on weather issues are similar among all three options. In the event that a segment of line needs repair, consideration must be given to how long it would take to find the problem and fix it. If one route has better or easier access than another route, it will be more reliable over time. Overall, Alternatives A and B have easier access than Alternative C. Reliability is also a function of the line's proximity to bird nesting. The closer the line is to bird nesting the greater the potential for electrocution, and line outage. No substantive differences were noted among the three alternatives related to the potential for electrocution. In all cases, bird strike diverters will be placed on the actual constructed lines (where applicable) to minimize these potential impacts. Reliability is also a function of the length of span across rivers; the longer the span, the more susceptible to outage and the harder it is to repair. Alternatives A and B cross the larger river systems in the project study area (e.g., Teton River, Marias River) with shorter spans than Alternative C.

iii. Land use considerations. Existing land use is similar within the entire project study area; however there are minor differences among the three alternatives. Given the importance of minimizing impacts to agricultural land, irrigated cropland in particular, one of MATL's specific goals is to avoid to the extent possible all impacts to irrigated lands. With this in mind, according to detailed orthophotographic analysis, each route was selected to cross a minimal amount of irrigated farmland (See Table 4.6-8b). In comparing alternatives, Alternative A crosses the fewest miles of irrigated cropland (0.11 miles) versus Alternative B (1.6 miles) and Alternative C (2.0 miles). Given the importance of avoiding impacts to irrigated agricultural lands, Alternative A results in the least impact related to current/existing land use.

iv. Socioeconomics. As shown in Section 4.6, socio-economic impacts and benefits are essentially equal for all project alternatives. Given this, no substantive or significant comparisons can be made among the alternatives. All would have a similar positive net impact on the tax base and on short term employment.

v. Earth resources. Soil and geologic resources were found to be highly similar along the three alternative routes. As shown in Table 4.4-3, a vast majority (more than 95 percent) of each alternative has slopes less than 15 percent. Approximately 89 percent of the Preferred Alternative Route A has soils greater than 10 inches deep, while Alternative B has approximately 90 percent and Alternative C has approximately 91 percent (Table 4.4-4). Similarly, approximately 64 percent of Preferred Alternative A crosses cretaceous shale (generally considered to be prone to wind and water erosion) and 63 percent of Alternative B, respectively. A somewhat higher 74 percent of Alternative C crosses cretaceous shale

(Table 4.4-5). Any impacts to earth resources would be mitigated or avoided through use of Best Management Practices adopted by MATL and the Storm Water Pollution Prevention Plan. In addition, measures identified in Section 5.3, *Environmental Protection Measures*, would be applied to appropriate areas to reduce potential for impacts to soil/earth resources.

vi. Engineering considerations. Engineering considerations are similar among all three routes. For instance the linear miles of steep slopes (greater than 30 percent), are similarly small (less than 1 mile) along each of the three routes. The vast majority of each route is within an area that has slopes of less than 15 percent. Both the preferred Alternative A, and Alternative B cross 25 different drainages (coulees, wetlands, rivers), while Alternative C crosses 21 drainages (See Tables 4.5-7 to 4.5-9). While the preferred route has slightly more angle structures than the other two alternatives, this is due to the fact that MATL has worked with landowners along the preferred route for several months and siting decisions have benefited from several months of landowner consultation. MATL has addressed landowner concerns above and beyond the minimum siting criteria, and has tried to be a "good neighbor".

vii. Visual resources. Visual resources are similar along each of the alternative routes, though ultimately preferred Alternative A has a lesser aggregate potential for impact than the other alternatives. In particular, there are fewer numbers of residential and commercial structures located within one mile of Alternative A than the other two alternatives. Preferred Alternative A comes within a mile of 146 residential structures and 24 commercial structures. Alternative B comes within a mile of 170 residential structures and 26 commercial structures. Alternative C comes within a mile of 160 residential structures and 23 commercial structures (see Table 4.6-10). Given that visual resources are largely unmitigable, it is important to select an alternative that minimizes these impacts to the extent possible. Preferred Alternative A achieves this goal.

viii. Biological resources. Community types crossed by Alternative A, B and C are very similar (Table 4.5-5) and provide similar potential habitat for birds, raptors, mammals, reptiles, amphibians, etc.. Therefore differences between each route alternative in its respective impacts to vegetation, wetlands, and wildlife and fisheries are minimal. Potential impacts to biological resources, including vegetation, wetlands, wildlife and fisheries, and threatened, endangered, species are all estimated to be similarly low, and could be addressed through avoidance and/or mitigation measures (Section 5.3).

ix. Historic, archaeological, and paleo-resources. Cultural resources will be strictly avoided in the route selection process. Given the emphasis on avoidance, no specific mitigation will be required no matter which alternative is chosen. Actual comparisons of historical, archaeological, and paleontological resources near each route will be addressed via the Memorandum of Understanding (MOU) with MDEQ.

x. Recreation. Recreational resources are again very similar among the three routes. No substantive differences were found. With the exception of the Lewis and Clark National Historic Trail crossing at the Marias River and at the terminus buffer at Great Falls, as well as the shooting range northeast of Great Falls, there are no recreational areas, fishing access sites, or other developed recreational sites within any alternative corridor. Expected impacts to the Great Falls Shooting Sports Complex are similar among all three routes though Alternative A would impact 0.51 miles, whereas Alternatives B and C would impact 0.76 miles, respectively. There are no significant impacts to recreation resources based on any of the three alternatives.

xi. Water resources. Potential impacts to both surface and ground water resources would be similarly minor along all three alternative routes. In terms of water-based recreation, the only water body identified by the Montana Fish, Wildlife, and Parks (MFWP) as a blue ribbon or red ribbon river is the Missouri River. The river miles at which all three alternatives cross the Marias and Teton Rivers are considered Habitat Class 3 and Sport Class 4 fisheries.

Overall, construction and operation of the proposed project could impact water resources through:

- Erosion and sedimentation into water bodies increasing turbidity;
- Stream bank erosion and sedimentation;
- Inadvertent release of petroleum products associated with construction equipment;
- Herbicide use could result in runoff to streams; and
- Increased water temperature due to removal of riparian vegetation.

As specified in Section 5.3 MATL would adhere to an erosion and sediment control plan that would minimize the potential for sedimentation into water bodies. Strategies that would be included in the plan are maintaining vegetated buffer strips between work areas and water bodies and using erosion control devices when work areas need to be in close proximity to water bodies. To reduce the risk of inadvertent release reaching water bodies, MATL would also develop and implement a Storm Water Pollution Prevention Plan. Based on avoidance of sensitive resources and use of mitigation measures, no significant impacts to water resources are anticipated to occur under any alternative as a result of project activities.

xii. Noise, radio, and television interference and electric effects. MATL does not believe EMF is a health hazard; nevertheless, all three alternatives have been sited to be more than 0.25 mile from occupied residences. Therefore any potential impacts are avoided by this measure.

Due to the similarity of terrain, vegetation types, habitats, visual impacts, and socioeconomic concerns within the Project Study Area, there are only a few measurable differences regarding environmental resources among the three routes. In particular, minor differences exist among land use impacts (impacts to irrigated farmland) and impacts to visual resources. Alternative A results in fewer impacts to both resources. In addition, preference of Alternatives A and B over C exists when considering design and maintenance issues based on line length and access. Alternative C is longer and would require more wire, structures, and other equipment as well as more severe deflection points. Also, Alternative C is located in a less accessible area north of the Teton River.

Alternative A is slightly preferred over Alternative B due to maintenance costs. Alternative B is located nearer to the existing Northwestern Energy 115-kV transmission line than Alternative A which may create some access problems and decrease maintenance ease. In general, a parallel alignment was MATL's goal; however, some issues raised prevented MATL from paralleling the entire route to Great Falls. NorthWestern Energy did not want MATL to parallel their 115 kV line in some areas. In addition, siting criteria precluded MATL from paralleling the existing 115 kV line (e.g. proximity to occupied residences, irrigated agriculture, farm support buildings, and area landowners).

Therefore, based on the results of the comparison of environmental impacts and design considerations among the three alternatives, MATL selected Alternative A as the Preferred Alternative for the proposed transmission line. Alternative A would not result in significant impacts to resources considered, would limit design and maintenance requirements, and would meet the goals and objectives of the proposed project.

5.1.2 Evaluation of Alternatives

1) *Comparison of Relevant Alternatives*. While this transmission line will provide additional capacity to north central Montana, MATL is not developing this project to address capacity. If the tie line is not built, then the reliability/capacity benefits/the enabling of new large-scale wind farms, will not happen; and no improvement in competitiveness of Montana and Alberta markets (hence no reduction in prices). MATL is developing a transmission line not a generation project; although this project enables other generation projects, this project is NOT a generation project. This project allows other alternative generation projects (i.e. wind) to have access to markets.

2) *Transmission Alternatives.* For power flow studies please refer to the NorthWestern System Impact Study for the WECC 2005 light autumn adjusted for 2010 and the WECC 2008 heavy summer adjusted to 2012 cases. Further studies will be included in the WECC Three Path Rating work group system studies.

   Alternative Alberta to Montana transmission lines evaluated:

   - Lower voltage/capacity not economically feasible.
   - Higher voltage/capacity not enough interest in the market (Open Season Results)
   - Connection points: Only Lethbridge, Great Falls and Shelby can handle power flow. Shelby ruled out when MATL failed to reach agreement on tariff terms with WAPA.
   - Power flow studies indicate that an intermediate substation is required at mid point in the transmission line. The Cut Bank area was chosen because of the location.
   - Double circuiting is uneconomical.
   - Composite Core Conductor Technology is uneconomical.
   - Underground facility uneconomical/unfeasible.

3) *Alternative Energy Res. – Onsite Generation.* Does not apply

4) *Alternative Transmission Techniques – Underground*. Construction and operation of an underground 230-kV line is not economically viable. Buried lines have a cost factor of 10 to 15 times more than overhead lines. For example:

   - Georgia Electric Membership Corporation estimated that underground lines had a cost factor of 5-21 times that of overhead lines.
   (http://www.gatrans.com/gtcsite/wsglobal/images/OverheadUnderfoot7.04.pdf)

   - Navigant Consulting (A Review of Electrical Utilities Undergrounding Policies and Practices. March 8, 2005) estimated a cost factor of 7.3 times
   (http://www.lipower.org/pdfs/papers/underground_030805.pdf)

   - India Point Park (Providence, Rhode Island) Narragansett Electric. Power Burial Costs. This study estimated a cost factor of 4.5 times an overhead line.
   http://www.providence.edu/polisci/students/indiapointpark/plcosts.html

- Verbund. Austrian Power Grid. Underground 380 kV lines. This position paper estimates much greater construction and operation costs. In general, they estimate an underground line produces a cost factor of 10-12 times an overhead line.
http://www.verbund.at/en/apg/aktuelles/200302104_etso_kabel.htm

5) *Alternative Levels of Reliability*. MATL is not proposing this tie line to address a known reliability problem.

6) *Curtail Loads – non-construction alternatives.* Does not apply.

(7) *No action alternative.* The No action alternative would eliminate the potential benefits that the MATL line offers:
- The improved reliability of both the Alberta and Montana power transmission grids
- It will enable the development of new power generation projects in Alberta and Montana
- It will increase competition in the electricity markets

5.2 Project Design and Implementation

MATL would design, construct, operate, and maintain the proposed transmission system in accordance with the National Electrical Safety Code, U.S. Department of Labor Occupational Safety and Health Act (OSHA) Standards, and other guidance as appropriate for safety and protection of property. The following sections describe the system components, general construction methods, and operations of the proposed transmission line.

5.2.1 System Design

A description of system components, including structures, conductor, and hardware is provided in the following section. MATL substation transmission facilities and lines would be designed by reputable engineering design companies (i.e. SNC-Lavalin). MATL is confident in the company's ability to design a sound transmission line.

Transmission Line Structures

During the planning process, MATL considered three structure types for construction of the approximate 125 mile U.S. segment of the proposed Project: wood-pole H-frame, steel-pole H-frame, and steel single-pole. Based on availability of materials, MATL selected steel-pole H-frame as the primary structure in its Project design. Steel H-frames offer overall lower maintenance costs than wood, increased longevity over wood, and offer increased span lengths compared to single-pole structures thereby decreasing the number of required structures. **Figures 5.2-1** through **5.2-5** illustrate the typical steel-pole H-frame structures that will be used in combination on the proposed Project to address the various angles that would be necessary to accommodate changes in terrain and land use.

The proposed steel-pole H-frame structures would incorporate 230-kV design standard insulators, hardware, and ground wires to provide nearly corona-free operation, as well as reduce audible noise and radio and television interference. On the typical suspension structure, three insulator strings would be hung from each structure. Each string would have 12 individual insulators. One overhead galvanized steel ground wire, about 3/8-inch diameter, would be installed on one side of the top of the structure for lightning protection.

A second ground wire carrying a fiber optic cable for communications would be installed on the other side. At this time the fiber optic capacity of the line will only be used for MATL communications and those of MATL customers. MATL will also use the communication capacity to connect MATL facilities and those of NorthWestern Energy and Alberta Electrical System Operator. No plans have been made to use the excess fiber capacity for commercial purposes. However, MATL is investigating the possibility.

Holes would be augured to dimensions to accommodate new structures. New poles are typically set in the ground 10 percent of the pole's length plus 2 feet (i.e., an 80-foot pole would be buried 10 feet). Spacing between poles of the proposed 230-kV H-frame structures is about 23 feet. Approximately six structures per mile would be required. Depending on terrain, total disturbance at each structure location during construction would be about 10,000 square feet. Characteristics of the proposed steel-pole H-frame support structures are summarized in **Table 5.2-1a.** Characteristics of Single Pole structures are summarized in **Table 5.2-1b.** Single pole drawings comparable to **Figures 4-2, 4-3** and **Figures 5-1** to **5-5** are provided in **Figures 4-4** and **4-5** and **Figures 5-6** and **5-7**.

MATL will not plant any pole structures below the normal high-water mark. As far as stringing the line is concerned, if construction occurs during summer/fall months it may be possible to utilize a boat to string the line across a water body. If construction occurs during the winter months, clear-span bridges could be utilized when a stream is dry or frozen (See MATL's Environmental Protection Plan, December 2005). Small watercourses could possibly be forded if sufficiently frozen, or where fording conditions are not available, other potential options include portable bridge placement or use of existing access routes. Water crossing construction will be postponed if any excessive flows or flood conditions are present or anticipated.

Figure 5.1

Figure 5-2

Figure 5-3

Figure 5-4

Figure 5-5

Figure 5.6

Figure 5.7

Transmission Line Conductor

Electrical conductors provide the medium for flow of electrical energy. The circuit configuration and conductor size are shown in **Table 5.2-1a**. The conductor consists of strands of reinforced steel cable encased by aluminum strands. The steel cable provides the tensile strength to support the conductor; the aluminum conducts the electrical current. The minimum proposed ground clearance of the conductor is 22 feet, 2.3 feet higher than the 19.72 feet based on the National Electric and Safety Code (NESC). The electric and magnetic field strengths at the edge of the ROW (22.47 ft) are 6.081 KV/m and 243.534 mG, respectively. The EMF effects at the edge of the safety zone (52.33 ft) are 1.522 KV/m and 69.374 mG, respectively. **Table 5.2-1b** provides similar characteristics for single pole construction.

TABLE 5.2-1 (a)
TYPICAL DESIGN CHARACTERISTICS
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Design Element	Characteristic
Line Length within Montana (approximate)	132 miles
Right-of-Way (ROW) Width	105 feet operational
Thermal Capacity for 230-kV line	625 MVA @ 212^{o} Fahrenheit
Nominal Voltage	230,000 volts (230 kV)
Conductor Size	1590 kcmil Falcon
Conductor Type	ACSR (aluminum core steel reinforced)
Overhead Ground Wire	3/8-inch diameter galvanized
Electric field at edge of ROW	6.081 kV/m
Magnetic field at edge of ROW	243.534 mG
Electrostatic short-circuit current limit	5 milliampere (mA)
Structure Height (approximate)	H-frame: 75' – 110' (80' average)
Length of Span (approximate)	H-frame: 500' – 1600'; 800' ruling span
Minimum Ground Clearance of Conductor	22' @ 60^{o} Fahrenheit
Typical Structure Base Dimensions	H-frame: 1.5' x 23.5'
Land temporarily disturbed per site for conductor reel and pole storage yards	10 acres
Area required for each structure base	H-frame: 36 square feet

TABLE 5.2-1 (b)
TYPICAL DESIGN CHARACTERISTICS (Monopole)
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Design Element	Characteristic
Line Length (approximate)	132 miles
Right-of-Way (ROW) Width	105 feet operational
Thermal Capacity for 230-kV line	625 MVA @ 212^{o} Fahrenheit
Nominal Voltage	230,000 volts (230 kV)
Conductor Size	1590 kcmil Falcon
Conductor Type	ACSR (aluminum core steel reinforced)
Overhead Ground Wire	3/8-inch diameter galvanized
Electric field at edge of ROW	6.081 kV/m
Magnetic field at edge of ROW	243.534 mG
Electrostatic short-circuit current limit	5 milliampere (mA)
Structure Height	Wood monopole: 70' – 90' (80' average)
Length of Span	Wood monopole: 455' typical 500' maximum span
Minimum Ground Clearance of Conductor	19.72' @ 60^{o} Fahrenheit
Typical Structure Base Dimensions	Wood monopole: 12.25 X 28.5 inches Rectangular
Land temporarily disturbed per site for conductor reel and pole storage yards	10 acres
Area required for each structure base	Wood monopole: 13 sq. ft.

Estimated cost of single pole design would be approximately 25 percent more than the H-frame design.

Markers and Warning Devices

There are a number of bird strike diverters and warning devices on the market. One of specific note, the “firefly” bird flapper/diverter, alerts birds of the transmission line through light, motion, and reflectivity. For daytime deterrence, this diverter utilizes highly reflective materials and fluorescent colors designed for avian vision. Ten + hour glow-in-the dark materials are utilized for night time deterrence. The “firefly” also rotates in 3 to 5 mile per hour wind conditions to increase visibility. Additional technology will be explored and deployed as needed for site-specific application.

The Federal Aviation Administration recommends that colored aerial markers be installed along river crossings and near airports for increased visibility of the transmission line to aircraft. These would also be useful for agricultural areas sprayed with crop dusters. These ball markers are typically 36 inches in diameter (though 20 inch markers are permitted on approaches to airports below 50 feet) and are available in international orange, white or yellow (installed with alternating colors). Reflective tape can be installed on the markers to increase its nighttime visibility for aircraft. For transmission lines above 220 kV, a special corona-free inside surface coating is recommended.

New and Modified Substations

MATL was originally planning to build a substation adjacent to the Glacier Electric substation in Cut Bank, however MATL has opted to construct a substation to the south instead. In short, MATL will not be interconnecting to Glacier Electric at Cut Bank as there is no commercial need to do so. In addition, the Cut Bank location was congested and provided limited space for future expansion. Finally, a substation at Cut Bank did not provide any performance benefits.

The Marias Substation location is better because:

- It allows for a direct connect to the customer; therefore providing better service (i.e. more flexibility)
- There is no change in cost
- Future lines will be able to enter easily
- This line can still tie into 115 kV line to Cut Bank

MATL is also going through the interconnect process with NorthWestern Energy who will expand their substation to accommodate the MATL tie line and other proposed lines. MATL will submit a copy of the interconnect agreement with NWE as an addendum to this application when that becomes available.

In terms of field strengths at the property boundaries of substations in residential and subdivided areas; AMEC called NorthWestern Energy and Glacier Electric to ask about the field strengths of their substations. This information was not available from either entity.

Access Roads

Many existing trails and roads are present within and along the rights-of-way associated with the three route alternatives. In addition, the majority of land crossed is currently in agricultural use including cropland, livestock pasture, or enrolled in the Conservation Reserve Program (CRP). Wherever possible, construction crews would utilize disturbed areas, and travel overland to minimize disturbance and changes in original contours. In addition, measures would be taken to minimize impacts such as rutting and soil compaction in specific locations and during certain periods of the year. Such conditions could arise during heavy rains. As a result of the predominance of agricultural land use, and anticipated efforts to minimize new disturbance, MATL anticipates that only limited development of new temporary roads for construction access will be necessary. However, some access upgrading, and new access development in a few locations (e.g., in the vicinity of the Marias and Teton River crossings) involving vegetation clearing and re-grading may be necessary. Every attempt will be made to avoid such disturbances.

The only areas in which new access roads would be constructed are those locations with rugged topography which are the Marias and Teton River crossings. These areas do not have existing roads due to the terrain. Due to environmental protection measures, MATL does not foresee any significant impacts.

5.2.2 Project Implementation

Several Project phases, including construction, operation, and maintenance would be required to fully implement the proposed 230-kV Project. These are discussed below.

Construction

Table 5.2-2 provides a summary of construction tasks and required resources and equipment. Transmission line construction tasks would include the following:

- *Pre-Construction:* Includes environmental permitting, cultural resource clearance, final transmission structure siting, engineering design, land procurement, various utility studies, and major procurement.

- *Surveying:* Initial line survey work, consisting of survey control, route centerline location, profile surveys, and access surveys would occur before construction. LIDAR will be used to provide much of this information.

- *Geotechnical Survey:* Geotechnical investigations will be performed at key locations (e.g., medium and heavy angle deflection points) to establish foundation requirements. In order to prepare for construction, a geotechnical evaluation will be performed to test the integrity of various soils and to determine foundation requirements. The line will be designed with geotechnical considerations in mind. The line will have the ability to withstand anticipated high winds.

- *Access Planning and Preparation:* Crews would gain access from public roads as well as within the transmission line RoW for constructing, operating and maintaining the line. When possible, access to the RoW would be by existing trails and roads. Trails are generally two-track routes and are not maintained. Access for line construction would be truck travel within the RoW. Therefore, graded surface access roads are not planned or anticipated. Trails would be located at right angles to streams and washes. Existing roads and trails would be left in comparable or better condition than what existed before construction. The reason for the safety zone is to minimize the potential for encroachment and to ensure that if buildings are proposed near the line, the safety zone will be large enough to prevent them from encroaching near the line.

Gates would be installed where fences cross the RoW. Locks would be installed at landowner's request. Gates not in use would be closed but not locked unless requested by the landowner.

TABLE 5.2-2
SUMMARY OF CONSTRUCTION TASKS AND REQUIRED RESOURCES/EQUIPMENT
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Task	Crew Size	Typical Wage Level ($)[1]	Equipment
Access Fencing/Reclamation	2	15-18/hr	3/4 –ton post pounder
Framing	6	17-20/hr	Teleking 5-ton crane
			Bobcat
			1-ton crewcab pickup
Setting	8	17-20/hr	330 Texoma digger
			35-ton setting crane
			gravel truck
			air compressor w/ tamper
			Bobcat
			(2) 1-ton crewcab pickups
Anchoring	3	20-22/hr	radial arm digger or retrofitted trench hoe
Material Handling	2	17-20/hr	(2) trucks
Pole Hauling	3	20-22/hr	pole truck
			pickup
Stringing	31	20-26/hr	tensioneer
			puller
			30-ton crane and pickup
			soft line winder and pickup
			cat pulling soft line and pickup
			crane and pickup
			flat deck and small crane
			rider pole crew digger
			pole truck

1. Wage levels extrapolated from "Montana Prevailing Wage Rates – Heavy Construction" Rates Effective March 10, 2006

- *Delivery and Assembly:* Framing crews deliver poles, X-braces, cross-arms, insulators, and hardware to structure sites on flatbed trucks then assemble individual structures. During installation, poles are set directly in augured holes to a depth equal to 10 percent of the pole length, plus 2 feet. Crews would backfill holes, compact fill material to prevent structure movement or settling, and spread excess excavation material evenly over the site or transported off-site for disposal depending on landowner requests. At heavy angled and dead end structures, cast-in-place concrete footings would be installed. The maximum width at a dead-end 90 degree three-pole structure would require approximately 18,000 square feet of ROW. Any part of this area that is disturbed would be reclaimed. A temporary easement would be purchased for construction outside the 105-foot permanent easement. Crews would assemble structures and place hardware using man-lift trucks. Guy wires would be screwed into the ground using standard construction practices.

- *Conductor Installation:* After erecting all H-frame structures, conductor and ground wires would be installed. Large reels of conductor and overhead ground wire would be delivered to pre-selected pulling and tensioning sites (about every 2 miles) along the transmission line route. About 10,000 to 16,000 feet of conductor and overhead ground wire would be installed for each pull. Ground disturbance associated with pulling and tensioning sites would be 10,000 square feet every 2 miles, which will vary depending on terrain (WAPA 230 kV). Methods used to install conductor and overhead ground wire include using a small line (p-line) attached to the conductor or ground wire to pull the cable through pulleys attached to the insulator strings. Once the conductor/ground wire is pulled the necessary length, it is tightened. This tensioning allows the cable to sag (due to temperature and heat of electricity) enough to comply with the National Electrical Safety Code.

- *Restoration*: All disturbed areas associated with transmission line construction would be restored to pre-construction condition. These efforts typically include gate repair as necessary, revegetation, and waste material removal. AMEC will prepare a weed management plan that will be incorporated as part of the MEPA/NEPA documentation.

In most cases, by starting construction in fall/winter, crops have been harvested from fields; thus resulting in less impact to agriculture; also, there is no irrigation at this time. Typically land is frozen so there will be minimal potential for soil erosion and compaction, and rutting of land is minimized. The exception would be in areas planted with winter wheat – these areas would either be avoided or the landowner would be compensated.

Operation

System dispatchers at power control centers direct normal line operations. Dispatchers use MATL's facilities to operate circuit breakers, determine the amount of power required to serve the loads and configure the power system accordingly, schedule the proper generation amount, and monitor the power system to ensure reliable service. MATL intends to relinquish operational authority of the line to AESC and NWE. Circuit breakers also operate automatically to ensure safe transmission line operation. Normal farming and other activities are permitted on transmission line RoWs if these activities do not interfere with line operation and maintenance or create safety problems for MATL or others.

Future Capacity

MATL is not aware of any particular advantages one route may have over the other with respect to changes in multiple circuiting. To add future capacity, flatter terrain is more desirable than steeper topography. MATL believes the preferred route has the best prospects for expanding future capacity.

Maintenance

MATL's maintenance programs for the proposed transmission line would include routine aerial and ground patrols. Aerial patrols would be conducted annually and as needed after severe wind, ice, or lightning storms to check for damage to conductors, insulators, or structures.

Ground patrols generally occur every five years to detect equipment in need of repair or replacement. Ground patrols and subsequent repair activities are scheduled to minimize crop and property damage when possible. Noxious weed control plans developed in consultation with local weed districts or county weed programs would guide herbicide treatments.

Vegetation clearing may also be conducted in certain areas to minimize fire hazard to the proposed line.

For emergency repairs, crews would respond promptly to repair or replace damaged equipment. MATL representatives would meet with respective landowners to arrange compensation for damages incurred during emergency repair operations.

5.2.3 Alternative Construction Methods and Equipment

It is approximately 25 percent more expensive (on average) to build a single pole structure. The decision as to where to use single pole structures will be driven by local land use issues. Single pole diagrams are provided as an attachment to this submittal.

(1) *Building the line underground.* The rule of thumb is that an underground line is ten times the cost of an overhead line. That type of expenditure could not be supported by this project.

(2) *Unguyed self supporting angle and dead-end structures.* The expense to supply and install a self supporting dead-end structure is in the order of three times that of a guyed dead-end. Therefore guyed structures were chosen for economic reasons.

(3) *Helicopter use for stringing.* It is not our normal practice on the prairies to install a sockline by helicopter in order to string the conductors because of the additional expense of using a helicopter instead of normal terrain vehicles. Using the helicopter does not eliminate any of the work for the stringing crew and it does not eliminate the installation of sheaves. In fact special sheaves would need to be purchased or rented so that the "sockline" could be installed in the air. Stringing with helicopters is mainly used in extremely difficult access areas like mountains where it is difficult and expensive to travel down the right of way. MATL may use a helicopter for special locations such as major river crossings. Pulling the sockline across the Milk, North Milk, Marias and Teton Rivers could be done by helicopter or by boat and that would be the contractor's choice unless dictated to do otherwise.

5.3 Estimated Project Costs

This section addresses cost estimates and cost recovery information for the proposed project.

5.2.1 Cost Estimates

Consistent with requirements identified in ARM 17-20.811(1), Table 5.3.1 below provides estimates and a description of total costs and expenses attributable to the engineering, construction, and startup of the proposed facility and associated facilities up to the time of commercial operation.

Table 5.3-1 Cost Estimate Summary Up to Time Of Operation	
Type of Cost	**Cost**
Engineering (design, surveying)	$7,313,285
Procurement (poles, conductor, insulators)	$42,026,530
Construction	$25,441,229
Misc. materials	$4,414,940
Substations (Includes engineering, procurement and construction) No breakdown available at this time.	$21,972,005
Phase shifting transformer (PST) includes engineering, procurement, construction and transportation	$11,026,029

*Startup costs included in above costs.
*Transmission line costs in US Dollars (Converted from Canadian Dollars assuming a 1.15 exchange rate).

Consistent with requirements identified in ARM 17-20.811(2), Table 5.3.2 below provides estimates and a description of total costs by category. Categories include engineering & overhead, planning, design, QC, permitting; land acquisition; plant costs; transportation links (road costs); mitigation costs; inventories of materials; working capital; other costs. Note that all costs noted below for the Transmission Line and Substations are based on quotations from preferred vendors. The phase shifting transformer has been purchased with only transportation costs to be finalized. All other cost based on recommendations provided through subject matter experts' recommendations. The estimated accuracy of the following estimates ranges from +30% to -15%.

Table 5.3-2 – Project Costs by Specific Category Up to Time Of Operation			
Category of Cost			**Cost**
Engineering & overhead – planning, design, QC, permitting	Transmission line costs*	Engineering (design, surveying):	$6,790,721
		Procurement (poles, conductor, insulators	$30,236,014
		Construction	$19,948879
		Misc. materials	$2,874,375
	Regulatory and permitting		$1,621,340
Land acquisition	Land Deposits	Canada	$99,167
		US	$75,000
	Land Acquisition	Canada	$892,500
		US	$675,000
Plant Costs**	Lethbridge Greenfield		$11,075,000
	Phase Shifting Transformer – Lethbridge		$11,132,500
	Cut Bank		$6,129,000
	Great Falls		$1,800,000
Transportation links			No estimate – see Plant costs
Mitigation costs (contingency costs)	Land Acquisition: (10%)		$156,750
	Phase Shifting Transformer: (5%)		$556,625
	Substations: (15%)		$2,850,600
	Transmission Lines: (25% of Construction)		$4,987,220
Inventory of Materials – Spare parts of operations			No estimate
Working Capital (G&A)			$3,187,282
Other Costs - Estimated operations and maintenance costs are unavailable at this time as negotiations between MATL and NorthWestern Energy relative to operations and maintenance of the line are ongoing.			None available at this time***

*Startup costs included in transmission line costs.
**Plant costs includes transportation estimate.
*** This information will be submitted as an amendment to the application when it becomes available.

In particular, Mitigation Costs are expected to be fairly similar along the Preferred Route A and Alternatives B and C given the similarity of physical, biological and social resources along each route and similar distances of each route. Overall, any impacts to these resources will be avoided to the extent possible. Those impacts that cannot be avoided will be minimized, and mitigated.

At present, acres of estimated impact vary between approximately 38 acres for Preferred Alternative A, to 40 acres for Alternative B, and 43 acres for Alternative C (See **revised Table 4.3-1**). At an estimate of $2,000 per acre for initial mitigation of disturbances, the costs would be as follows: $76,000 for Preferred Alternative A, $80,000 for Alternative B, and $86,000 for Alternative C. These types of impacts relate to access, erosion control and reclamation/revegetation:

- *Access:* New access will be minimized to the extent possible. Access is expected to be developed at the Marias and Teton crossings for each of the three alternatives, requiring mitigation either to reclaim these areas following construction or maintain access routes for maintenance purposes. The miles of new access roads are expected to be 3 to 5 miles under each scenario.

- *Erosion Control***:** Erosion control is required by law and will be implemented as part of the storm water pollution prevention plan and MATL's reclamation plan. Each alternative shows a similar percentage of steep slopes (less than 5 miles of 15% or greater), reclamation constraints (less than 2 miles of severe reclamation constraints) and river/stream/coulee crossings (25 to 28 crossings), suggesting that mitigation will be similar for each alternative.

- *Reclamation & Revegetation* - A reclamation and revegetation plan will be implemented following construction and monitored to ensure that any disturbed sites (including ancillary construction areas, roads, etc.) will be reclaimed to conditions similar to that before construction occurred. This will be an ongoing process as multi-year monitoring is required to ensure compliance with MFSA requirements. The similarity of the landscape among each of the three alternatives suggests that mitigation will be similar among each possible route. In addition, Alternative C is longer than A or B suggesting that mitigation will cost slightly more as more structures will be required.

Other types of during/post construction mitigation common among the three alternatives include:

Land Use – The project will be constructed primarily on grasslands and agricultural lands. Any fences, gates or cattle guards that are damaged as part of construction will be repaired to at least their original condition upon completion of construction. The similarity of land use, among the three alternatives suggests that this impact would be similar for each alternative, and therefore mitigation costs would be similar as well. Alternative C is longer than A or B suggesting that mitigation will cost slightly more for Alternative C.

Wildlife – Required mitigation will also include bird strike diverter installation and utilization of raptor safe power line construction practices. The similarity of biological resources among the three alternatives (including vicinity to Wildlife Management Areas) suggests that this impact would be similar for each alternative, and therefore mitigation costs would be similar as well.

Marker Balls – Marker balls will be installed at areas of high crossings (for aviation safety) as well as at crossings of the Cenex and Conoco pipelines. There are 12 Conoco crossings of

Alternative A, 9 of Alternative B and 6 of Alternative C. Each alternative crosses the Cenex pipeline once.

MATL has allowed for a 25% contingency (to include) in their estimated construction costs for the transmission line, which provides more than adequate funds for any required mitigation. This contingency allotment earmarked by MATL is currently just shy of $5 million.

Consistent with ARM 17-20.811 (5), project costs have been provided for both the Canadian and US portions of the project. See Table 5.3-3 for a breakdown of major costs related to this facility in both Canada and the US.

Table 5.3-3
Project Costs for Project Portions in the United States and Alberta Canada

Location	Type of Cost		Cost
US Portion	Transmission line (not including contingencies):		$37,983,743
	Substations	Cut Bank	$6,129,000
		Great Falls	$1,800,000
	Contingencies		$4,514,163
	Permitting		$1,058,440
	Land	Deposits	$75,000
		Acquisitions	$675,000
		Contingencies	$67,500
Canadian Portion	Transmission line (not including contingencies):		$18,991,872
	Substations (not including contingencies):	Lethbridge (includes PST)	$22,207,500
	Contingencies		$2,217,875
	Permitting		$387,900
	Land	Deposits	$99,167
		Acquisition	$892,500
		Contingencies	$89,250
G&A (both Canada and US)			$3,187,282

5.2.3 Operation and Maintenance Cost Estimates

This information will be submitted as an addendum to this application when it becomes available.

5.2.4 Cost Escalation

ARM 17-20.811 (6) and ARM 17-20.815 (2) requires the applicant to escalate costs to start of construction. For this application, MATL has not used escalation because of the immediacy of the project. The construction is scheduled to start in Fall 2006 and will last 6 months. All costs for the Transmission Line, Substations and Phase Shifting Transformer categories are based on estimates made for scheduled construction dates. Any escalation charges, where required, are to be part of contingency costs. All other costs are based on estimates for work to project completion, therefore no escalation charges are required.

5.2.5 Cost Recovery

This section explains how costs are recovered for a merchant line using an open bid process (consistent with requirements of ARM 17.20.817). In short, all of the unsold capacity will be sold through competitive auction on MATL's OASIS (open access same-time information system) system. The details of this are further described in the FERC tariff application which will be provided as an Appendix to this application after it has been filed with FERC.

More specifically, Great Plains has an agreement for 120MWs of firm transmission capacity with MATL that allows them to transmit power northward from Cut Bank Montana into Alberta. In certain circumstances Great Plains may utilize their redirect rights to transfer power from north to south. GE Energy has an agreement for 175MWs of firm transmission capacity with MATL that allows them to transmit power southward from Cut Bank to Great Falls, Montana. In certain circumstances, GE may utilize their redirect rights to transfer power from south to north into Alberta. All firm shippers on the MATL line will have the ability to sell unused capacity to a secondary market during periods when they can not utilize their full capacity. MATL is planning on instituting an auction trading system for firm and non-firm capacity. MATL plans to purchase an Open Access Same Time Information System ("OASIS") from Open Access Technology International Inc. ("OATI"). The OASIS system will be part of the so called wesTTrans system. The OASIS system will allow capacity owned by MATL or its firm customers to be auctioned to the highest bidder on a monthly, weekly, daily, and hourly basis.

5.3.6 Methods of Financing

Consistent with requirements of ARM 17.20.815 (3), this section provides information about the likely methods of financing construction of the facility. In short, MATL has every intention to build this power line. No construction can start until all permits and licenses in place. At that time, MATL shall have all of its financing available and the project will move forward.

One of Canada's largest financial firms will have completed equity financing by mid-March 2006. Several offers have been received for debt financing. Debt negotiations were scheduled to be finalized by the end of March 2006. Drawings on debt will be subject to receipt of permits and licenses. Overall, MATL believes there will be sufficient funds to build the project. In addition, fixed price construction contracts will be locked down before construction is started.

5.3.7 External Costs

External costs associated with the proposed project, though difficult to quantify, may include the following:

- costs/or and inconvenience due to avoidance of the new transmission line in farmed areas subject to crop dusting operations.
- costs associated with modifications to GPS network infrastructure (i.e., repeater installation/modification, tractor modifications)
- Impacts (real or perceived) to property values in the vicinity of the transmission line.

5.4 Environmental Protection Measures

Several documents would provide environmental protection guidance to MATL during Project construction and operation. These documents would include applicable portions of Western Area Power Administration's (Western's) *Construction Standard 13* (Western 2001), project-specific mitigations, requirements of supporting Federal, state, and local/county permits, and *Raptor-safe Power Line Construction Practices* developed by the Edison Electric Institute (EEI 1996). Summaries and/or applicable parts of each of these documents follow.

Western Construction Standard 13:

MATL has reviewed and would adopt several specific construction guidance standards provided in Western's *Construction Standard 13, Environmental Quality Protection* document. *Standard 13* is provided in **Appendix G**. Applicable standards to be adopted by MATL include the following:

- *Landscape Preservation (Section 13.3)*: Includes guidance to preserving landscape features, constructing and restoring construction roads, and constructing and restoring construction faciliteis, such as offices and storage yards.
- *Preservation of Cultural Resources (Section 13.4)*: Provides requirements for treatment and notification of know or discovered cultural sites or artifacts.
- *Noxious Weed Control (Section 13.5)*: Requires a "clean vehicle policy" while entering and leaving construction areas to prevent transport of noxious weed plants and/or seed.
- *Disposal of Waste Material (Section 13.8)*: Requires removing and disposing all waste material generated during construction.
- *Pollutant Spill Prevention, Notification, and Cleanup (Section 13.10)*: Requires measures to prevent spills of pollutants and appropriate response if a spill occurs. Includes any solvent, fuel, oil, paint, pesticide, engine coolant, or similar substances.
- *Prevention of Air Pollution (Section 13.13)*: Ensures that construction activities and equipment operation reduce air pollutant emissions, and that nuisance dust is controlled.

Project Specific Mitigation Measures:

Specific mitigation measures developed on a resource-by-resource basis are summarized in **Table 5.4-1**. Implementation of a worker education program, and as appropriate, on-site environmental monitors would ensure that mitigation measures identified in **Table 5.4-1** are strictly followed.

TABLE 5.4-1 SUMMARY OF ENVIRONMENTAL PROTECTION MEASURES MONTANA ALBERTA TIE LTD. LETHBRIDGE, AB – GREAT FALLS, MT			
Category	**Environmental Protection/Mitigation Measures/Monitoring**	**Effectiveness**	**Timing**
General	Construction personnel will be instructed on the location and identification of sensitive resources within or adjacent to the project ROW, as well a regulations pertaining to the protection of cultural and ecological resources.	Will help prevent damage to sensitive and/or protected resources.	Prior to construction
Erosion Control	Erosion Control Plan identifying locations and specifications of measures to minimize erosion and sedimentation.	Re-establish vegetation, and implement physical barriers to minimize soil movement on exposed slopes.	Pre-construction
	Construction contractor implementation of erosion control measures (e.g., water bars, drainage contours, straw bales, filter cloth, or similar). All off-site vegetative materials certified “weed free”.	Implemented in areas with steep slopes to minimize soil movement.	During construction
Access	Access limited to existing roads or two-track utility corridor, unless not feasible for transport of equipment/material.	Avoidance of new permanent vehicular access and long-term ground disturbance.	During construction
	General engineering design plans for unforeseen temporary use areas (TUAs).	Disturbance minimization and/or protection of natural resources.	Pre- and during construction
	All construction vehicle movement or temporary use areas outside the right-of-way sill be coordinated with the authorizing agency and restricted to pre-designated access, contractor acquired access, or existing roads.	By limiting access to the project area, unnecessary impacts to soils and vegetation can be avoided or minimized.	During construction.
	At sites with soils that are sensitive to compaction, construction will be done with low bearing pressure vehicles or compacted soil will be rehabilitated after construction by discing, plowing or other means.	Weight limiting/distributing to reduce soil compaction and ground cover damage.	During/post construction
	Restricted access road widening unless essential for project implementation.	Minimizes damage to soils and vegetation.	During construction
	Construction will be planned to avoid periods of intense farming (e.g., grain harvest) as applicable.	Avoid impacting farming practices as well as crop damage.	During construction.
	Fences, gates and cattle guards will be repaired or replaced to their original condition if damaged during construction.	Replacement or repair as an effective resolution to property damage.	Post-construction
	MATL will work with the MDT in the design and construction of structures along or crossing any highway right-of-way.	Minimizes traffic disruption.	Pre-construction
	Existing roads will be properly maintained, grading may be necessary.	Maintenance of proper drainage.	During and post construction

	Access not required for operation/maintenance will be closed using the most effective method with landowner concurrence.	Prevention of permanent motorized vehicle use and resulting disturbance to soil/vegetation.	Post-construction
	During project final design, structures and associated disturbances will be located to avoid or minimize impacts to known sensitive features such as water courses, residences, or cultural resource sites.	Avoid/minimize impact to sensitive features.	Pre-construction
	All construction vehicles will be restricted to the certificated construction right-of-way, associated facilities, and permitted access roads.	Avoid/minimize environmental impact.	During construction
Surface Water and Wetlands	Locations for new structures would be selected to avoid 100-year floodplain encroachment where practicable.	Avoidance will prevent potential disturbance within 100-year floodplains.	Pre-/during construction
	MATL will prepare and erosion control plan, whereby measures, locations of measures, and specification for measures will be used to minimize erosion and sedimentation. As a part of this a storm water prevention plan will be submitted and approved by the MDEQ.	Effective erosion control planning to reduce erosion.	Pre-construction
	Unavoidable wetland impacts would require permits from U.S. Army Corps of Engineers to comply with Section 404 of the Clean Water Act.	Mitigate unavoidable impacts to wetlands and other waters of the U.S.	During design and construction
	If work in a 100-year floodplain is unavoidable, DNRC would be consulted during the design phase and, if required, appropriate permit(s) would be obtained and implemented.	Permit stipulations would avoid or mitigate potential disturbance within floodplains.	Pre-/during construction
	Wherever possible, placement of new structures and associated construction activities would occur out of wetland boundaries.	Avoidance of impacts to wetlands and other waters of the U.S.	Pre-/during construction
Reclamation & Revegetation	Disturbed areas will be reclaimed by appropriate contouring and replanting with an approved seed mix. All seed mixtures will be certified “weed free”.	Re-establishing desirable vegetation cover on disturbed sites to prevent soil loss and weed infestation.	Post-construction
	Tree removal will be kept to a minimum. If feasible, equipment should go around wooded areas.	Avoiding or selectively cutting trees will protect limited forested habitats.	During construction
	Noxious weeds would be controlled through implementation of noxious weed control plans approved by appropriate county agencies.	These efforts will reduce or eliminate introduction and spread of invasive, noxious plants.	Pre-/during construction
	Disturbed areas would be reclaimed to pre-construction condition or landowner requests as site work is completed.	Reduce or eliminate erosion, and weed invasion.	During/post construction
	Any reseeding will be done with an approved seed mixture.	Reduce or eliminate spread or invasion of noxious weeds.	Post construction
	If necessary, vehicle wash stations will be located at appropriate locations and will be used to minimize the spread of noxious weeds along the ROW. all construction equipment will be thoroughly washed prior to first use on the project.	Cleaning will remove mud dirt and plant parts from undercarriages, tires, grills, radiators etc. This will reduce potential of spreading noxious weeds.	During construction

	All fill mixture brought into construction areas will be free of noxious weeds.	Borrow site should be inspected to minimize movement of noxious weeds.	During construction
Health & Safety	All on-site servicing or refueling of construction equipment will be performed using protective spill containment or absorption mats.	To prevent spills of pollutants such as fuels, and lubricants.	During construction
	Storage of oil fluids or petroleum products onsite is prohibited. All petroleum products shall be removed to a disposal facility authorized for disposal.	Reduces chances of spills and ensures proper storage and disposal of fuels and lubricants.	During construction
	Disposal of all construction debris/trash, contained and removed on a daily basis.	Daily containment and removal will prevent accumulation and windblown trash.	During construction
	Traffic management and control of local roadways would be considered during construction.	Avoid unnecessary impacts to local traffic patterns.	During construction
Human Health & Environment	MATL/NWE would address individual complaints concerning radio and television interference as needed. Shielding, where practicable, would alleviate interference with electronic monitoring equipment.	Alleviate individual impacts to radio and television users in vicinity of line.	Pre/post-construction
	Design would incorporate reduction or elimination of induced current and voltages, to avoid steady state current shocks.	Eliminate impacts associated with proximity and electric shock.	Pre-construction
	Design and construction would be such to reduce electromagnetic field to the extent feasible.	Reduce potential for EMF effects.	Pre-construction
Land Use	Construction will be planned to avoid periods of intense farming (e.g., grain harvest) as applicable.	Avoid crop damage.	Pre-/during construction
	Fences, gates and cattle guards will be repaired or replaced to their original condition if damaged during construction.	Resolution of potential property damage through replacement or repair.	Post-construction
	MATL will secure encroachment permits from the Montana Department of Transportation and counties for the design and construction of structures along or crossing any highway right-of-way.	Minimize impacts and safety concerns in the vicinity of roads and highways.	Pre-construction
Cultural	A project map will be provided to the contractor identifying all sensitive areas relative to the selected alternative.	Contractor awareness and mitigation implementation (notification and/or avoidance).	Pre-construction
	Archeological monitors (including tribal) will be used when working in the vicinity of archeological sites.	Will monitor and work closely with MATL and contractor to ensure application of mitigation/avoidance measures.	During construction
	Selective pole placement will be used to avoid impacts to heritage resource sites.	Heritage resource site protection.	Pre-construction
	Access routes through heritage resource sites will be prohibited.	Heritage resource site protection.	Pre-construction
	If any buried antiquities or remains are discovered, the contractor will notify MDEQ and SHPO prior to continuing work.	Will allow for proper treatment of any undiscovered sites.	During construction
Visual	Structures would be placed to avoid or span visually sensitive features whenever possible.	Reduce potential visual quality impacts.	Pre-/during construction

	No paint or permanent discoloring agents will be applied to rocks or vegetation. All flagging will be removed upon completion of the project.	Reduce potential visual quality impacts.	Pre-/during construction
Wildlife	Raptor safe power line construction practices (Edison Electric Institute, Avian Power Line Interaction Committee) will be employed during transmission line construction.	To reduce risk of electrocution to perching raptors.	Pre-/during construction
	Approved line marking devices will be installed at appropriate intervals and appropriately staggered on each overhead ground wire across stream crossing and migratory bird flyways (e.g., wetland crossings) within the ROW.	Minimization of potential bird strikes at stream crossings and other high use areas.	Pre-/during construction
	MATL would consult with FWP concerning construction activities (e.g., timing) near sharp-tailed grouse leks.	Timing restrictions on construction near sharp-tailed grouse leks would reduce potential disturbance to grouse.	Pre-/during construction
Air Quality	Water will be sprayed on areas in proximity of residences and communities that are producing excessive airborne dust.	Dust suppression during dry periods or near populated areas.	During construction

References:

Edison Electric Interstate, Avian Power Line Interaction Committee, U.S. Fish and Wildlife Service. 2005. Avian Protection Plan Guidelines. 87 pp.

Western Area Power Administration, 2003. Construction Standards, Standard 13, Environmental Quality Protection. 15 pp.

Federal, State, and Local/County Permits

The proposed Project's construction would require several Federal, state, and local/county permits. Terms and conditions of these permits would require MATL to minimize erosion, conduct reclamation, and maintain air and water quality standards. **Table 1-2** (pp. 11 – 12) provides a summary of all anticipated Federal, state, and local/county permits.

6.0 REFERENCES

Aaberg, Stephen 2000. Interstate 15-Conrad Montana Department of Transportation Class III Cultural Resource Survey Results. Crabs Document No. PN 4 22616.

Alt, David and Donald W. Hyndman, 1986, Roadside Geology of Montana, Mountain Press Publishing Company, Missoula.

American Conference of Governmental Industrial Hygienists (ACGIH), 2003. Reference levels for occupational exposure and exposure of the general public to electric and magnetic fields at power frequencies.

Axline, Jon 1995. Montana Cultural Resource Inventory of the Great Northern Railway. CRABS Document No. CA 4 17722.

Bat Conservation International. 2002. Bat Species of the United States. Available at http://www.batcon.org. Accessed September 2005.

Beaulaurier, D.L., James, B.W., Jackson, P.A., Meyer, J.R., Lee, J.M., Jr. 1982. Pages 539-550 in: Third Annual International Symposium on Environmental Concerns in Rights-Of-Way Management, San Diego, California.

Beaulaurier, D.L. 1981. Mitigation of Bird Collisions With Transmission Lines. Bonneville Power Administration. Portland, Oregon.

Benton Lake Brochure, United States Fish and Wildlife Service (USFWS), 2001, Benton Lake National Wildlife Refuge, Great Falls, Montana.

Bonneville Power Administration, 1982. Schultz-Hanford Area Transmission Project Appendix I: Electrical Effects

Brumley, John H. 1997 A Class I Cultural Resource Inventory of the Proposed North Central Montana Regional Water System. CRABS Document No. ZZ 623236.

California Department of Health Services, 2002. An Evaluation of the Possible Risks from Electric and Magnetic fields from Poser Lines, Internal Wiring, Electrical Occupations and Appliances.

Cascade County Planning Department, personal communication, September 2005.

Choteau County Planning Department Personal Communication September 2005.

Conway, C.J. and J.C. Simon. Comparison of Detection Probability Associated with Burrowing Owl Survey Methods. 2003. J. Wildlife Management. 67(3): 501-511.

Cultural Resource Inventory, Evaluation and Management Plan. Report prepared for PPL Montana by Renewable Technologies, Inc., Butte. CRABS Document No. CA 6 26127.

Dau, Barry 1991. The Proposed Sun River Electric Cooperative Society Midway-Brady Transmission Line. Crabs Document No. PN 6 12166.

DeVelice, R.L. 1991. Plant communities of the Kevin Rim, Toole County, Montana: Preliminary survey results. Montana Nat. Her. Prog., Helena, MT. 14 pp.

DuBois, K. 1989. Arising, alighting ibis. Montana Outdoors 20(6):30-33.

Dubois, K.L. 1988. High nesting density of birds of prey near Kevin, Montana. Final Report. USDI, Bureau of Land Management, Great Falls, MT. 8 pp.

Edison Electric Institute (EEI) and Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines. Edison Electric Institute/Raptor Research Foundation, Washington, D.C., 128 pp.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Dept Army, Waterway Exp Stat Tech Rep Y-87-1. Vicksburg, Miss.

EPA (U.S. Environmental Protection Agency). 2004. Primary Distinguishing Characteristics of Level III Ecoregions of the Continental United States. Available at http://www.epa.gov/wed/pages/ecoregions/level_iii.htm Accessed 3 August 2005.

Faanes, C.A. 1987. Bird Behavior and Mortality in Relation to Power Lines in Prairie Habitats. U.S. Fish and Wildlife Service. Fish and Wildlife Technical Report 7.

Ferguson, David and Gene Munson 1995. Class III Cultural Resource Inventory of the CENEX Front Range Pipeline. Report prepared for CENEX, Inc, Trigon Engineering and Morrison-Maierle, Inc., by GCM Services, Inc., Butte. CRABS Document No. ZZ 5 16880.

Fisher, Foster B., Chris Winne, Michele M. Thornton, Troy P. Tady, Zhenkui Ma, Melissa M. Hart, and Roland L. Redmond. 1998. Montana GAP Analysis, Montana Land Cover Atlas. Available at http://nhp.nris.state.mt.us/community/GAP/types.htm. Accessed April and August 2005.

Genter, D. L. and K.A. Jurist. 1995. Bats of Montana, Montana Natural Heritage Program, Helena, Montana. Available at http://nris.state.mt.us/mtnhp/ . Accessed September 2005. 11 pp.

Gray, Dale M. 2004. Cultural Resource Survey and Assessment of 2 km North of Great Falls in Cascade County Montana. Crabs Document No. CA 4 2757 2.

Haigh, June G., 1980, Soil survey of Glacier County area, and part of Pondera County, Montana, Agricultural Experiment Station, Bozeman.

Hendricks, P. 2000. Preliminary bat inventory of caves and abandoned mines on BLM lands, Judith Mountains, Montana. Montana Natural Heritage Program, Helena, Montana. 21 pp.

James, B.W. and B.A. Haak 1979. Factors Affecting Avian Flight Behavior and Collision Mortality at Transmission Lines. Final Report. Bonneville Power Administration, Portland, Oregon.

Johnson, Bob. 2005. Refuge Supervisor, USFWS Benton Lake National Wildlife Refuge. Personal communication. September 2005.

Jones, W.M. 2003. Milk and Lower Marias River Watersheds: Assessing and Maintaining the Health of Wetland Communities. Report to the Bureau of Reclamation. Montana Natural Heritage Program, Helena, Montana. 133 pp.

Kingery, Paul,1991. Corona and Field Effects Program on the MICROSOFT FORTRAN Version 5.10 Compiler. Based on previous versions compiled by the Bonneville Power Administration. June.

Kuchler, A.W. 1964. Potential Natural Vegetation of the Conterminous United States. American Geographical Society, Special Publication No. 36.

Maddock, B.J.,1992. Overhead Line Design in Relation to Electric and Magnetic Field Limits, IEEE Power Engineering Journal. September.

Martorano, Marilyn, et al., 1987. Cultural Resource Inventory of the Conrad to Shelby 230KV Transmission Line Project. CRABS Document No. TL 6 9928.

McBride, 1999. Power-frequency Electric and Magnetic fields and Risk of Childhood Leukemia in Canada, Amercan Journal of Epidemiology. July 15.

Meyer, J.R. 1978. Effects of Transmission Lines on Bird Flight Behavior and Collision Mortality. Prepared for Bonneville Power Administration Engineering and Construction Division, Portland, Oregon.

Montana DEQ (Department of Environmental Quality). 2004. Circular MFSA-2. Application Requirements for Linear Facilities. Alternative Siting Study Baseline Study Impact Assessment.

MDEQ 2005a. Open Cut Mine data.

MDEQ 2005b. Transmission lines in the study area. Clipped from MDEQ GIS data.,

Montana County Noxious Weed Control Act. 2005. Montana Code Annotated (MCA §7-22-2101 to 2153). Available at http://data.opi.state.mt.us/bills/mca_toc/7_22_21.htm.

Montana Department of Environmental Quality (DEQ), Air Resources Management Bureau Web Site, Air Quality Nonattainment Information.

MDT 2005a. Montana 2005 Aaeronautical Chart. Montana Department of Transportation, Aeronautics Division.

Montana Department of Transportation, 2005b. Montana Highway System Route Map, Montana Department of Transportation, ftp://ftp.mdt.mt.gov/map/.

MFIS (Montana Fisheries Information System). 2005. Available at http://maps2.nris.state.mt.us/scripts/esrimap.dll?name=MFISH&Cmd=INST. Accessed October 2005.

MNHP (Montana Natural Heritage Program). 2003. Plant Species of Concern, Montana Natural Heritage Program, Helena, Montana. 34 pp.

MNHP. 2004a. Montana Community Field Guide. Montana Natural Heritage Program, Helena, Montana. Available at http://nhp.nris.state.mt.us/Community/index.htm. Accessed August 2005.

MNHP. 2004b. Montana Animal Species of Concern, Montana Natural Heritage Program, Helena, Montana. 11 pp.

MNHP. 2004c. Montana Animal Field Guide. Montana Natural Heritage Program, Helena, Montana. Available at http://nhp.nris.state.mt.us/animalguide. Accessed September 2005.

MNHP. 2005. Montana Bird Distribution: Bald Eagle. Montana Natural Heritage Program, Helena, Montana. Available at http://nhp.nris.state.mt.us/mbd/. Accessed October 2005.

MNHP. 2005b. Species of concern report in vicinity of the Montana Tie Proposed Transmission Line. Species of Concern Reports. Montana Natural Heritage Program, Helena, MT. Available at http://mtnhp.org. Requested April 2005.

MNHP. 2005c. Montana Plant Field Guide. Montana Natural Heritage Program, Helena, Montana. Available at http://nhp.nris.mt.gov/plants/index.html?guidebook.asp. Accessed October 2005.

MNHP. 2005d. Montana Bird Distribution: Burrowing Owl. Montana Natural Heritage Program, Helena, Montana. Available at http://nhp.nris.state.mt.us/mbd/. Accessed October 2005.

MNRIS (Montana Natural Resource Information System). 2005. GIS Data. Available at http://nris.mt.gov/ Accessed September 2005.

MNRIS. 2002. River Mileage Classifications for Components of the National Wild & Scenic Rivers System. Available at http://www.nps.gov/rivers/wildriverstable.html. Accessed September 2005.

MNRIS 2005. Montana Natural Resource Information System, Airport Data (Matt)

MPIF (Montana Partners in Flight). 2000. Bird Conservation Plan Montana VERSION 1.0. Available at http://biology.dbs.umt.edu/landbird/mbcp/mtpif/potholes.htm. Accessed August 2005.

Moore, Connie and Jim Duran 1986 Cultural Resource Inventory and Assessment: Cut Bank North (RS 213-1(3)0.

Munson, Gene 1996. Class III Cultural Resource Inventory of the Santa Rita to Canadian Border CENEX Pipeline. GCM Services, Inc., Butte. CRABS Document No. GL 6 18511.

Mussehl, T.W. and F.W. Howell. 1971. Game Management in Montana, Montana Department of Fish, Wildlife, and Parks, Helena, Montana. 238 pp.

National Institute of Health, 1999. Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. June.

NWI (National Wetland Inventory). 2004. U.S. Fish and Wildlife Service. Accessed August 2005. Available at http://wetlands.fws.gov/.

NWRS (National Wildlife Refuge System). 2005. America's National Wildlife Refuge System. U.S. Fish and Wildlife Service. Available at http://www.fws.gov/refuges/faqs/WPAs.html# . Accessed August 2005.

Nesser, J.A., G.L. Ford, C. Maynard, C. Lee, D.S. Page-Dumroese. 1997. Ecological units of the Northern Region: subsections. Gen. Tech. Rep. INT-GTR-369. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 88 p.

Newell, Alan S. 1985. Supplemental Report: Historic Sites Along the Environmentally Preferred Route and Associated Access Easements Great Falls-Conrad Transmission line Project. CRABS Document No. TT 6 9831.

Olendorff, R.R., Miller, A.D., and Lehman, R.N. 1981. Suggested Practices for Raptor Protection on Power Lines. The State of the Art in 1981. Raptor Research Foundation, St. Paul, MN. Prepared for Edison Electric Institute, Washington, D.C.

Olson, G. 2005. Region 4 game biologist. Montana Fish, Wildlife, and Parks. Conrad, MT. Personal communication, 2 May 2005.

Olson, G. 2005b. Region 4 game biologist. Montana Fish, Wildlife, and Parks. Conrad, MT. Personal communication. 11 October 2005.

Omernik, J.M. 1987. Ecoregions of the Conterminous United States. Map (scale 1:7,500,000). Annals of the Association of American Geographers 77:118-125.

Pondera County Planning Department Personal Communication September 2005.

Primm, S., J. Shay, S. Chaplin, K. Carney, E. Dinerstein P. Sims, A. G. Appleby, R. Usher, K. Kavanagh, M. Sims,G. Mann. 2001. Northern short grasslands. Available at http://www.worldwildlife.org/wildworld/profiles/terrestrial/na/na0811_full.html. Accessed August 2005.

Report prepared for the Montana Department of Highways, Helena, by GCM Services, Inc, Butte. CRABS Document No. GL 4 3779.

Rossilion, Mitzi 2003. Missouri-Madison Hydroelectric Project Great Falls Group Recreational Development and Lands Management, Cascade County, Montana:

Safe Drinking Water Act, Section 1401, 42 United States Code (USC) 300f.(15)).

Schroeder, M. A. 2001. Breeding bird diversity and density in relation to restoration efforts for sharp-tailed grouse on wildlife areas in north-central Washington. Progress Report. Washington Department of Fish and Wildlife.

Schroeder, M.A. 2001a. Job Progress Report Federal Aid in Wildlife Restoration: Sharp-tailed Grouse ecology and population dynamics in Washington. Progress Report. Washington Department of Fish and Wildlife, Olympia WA, USA. 33p.

Sims, P.L. 1988. Grasslands. In Barbour, M.G. and Billings, W.D. (eds), North American terrestrial vegetation. Cambridge University Press, Cambridge. Pp. 265-286.

Soil Survey of Toole County, Montana, Part 1, United States Department of Agriculture in Cooperation with the Montana Agricultural Experiment Station.

USDI (U.S. Department of the Interior). 2004a. Instruction Memorandum No. MT-2004-082: 2004 Montana/Dakotas Sensitive Species List, Transmitted from Donald Smurthwaite, Acting BLM State Director, to Field Managers on July 28, 2004. 6 pp.

USDI. 2004b. Draft Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States, DES 0441, Bureau of Land Management. Available at http://windeis.anl.gov/. Accessed August 2005.

U.S. Environmental Protection Agency, 1978. Protective Noise Levels (Condensed Version of EPS Levels Document). November. (PB82-138827).

United States Geological Survey (USGS) Earthquake Hazards Program Web site, http://earthquake.usgs.gov/qfaults/usmap.html.

United States Geological Survey (USGS). 2005. Northern Prairie Research Center. Wetland Plants and Plant Communities of Minnesota and Wisconsin. Available at http://www.npwrc.usgs.gov/resource/plants/mnplant/intro.htm. Accessed August 2005.

USFR (U.S. Federal Register). 1999. Presidential Document, Executive Order 13112. Invasive Species. Federal Register 64:6183-6186.

USFWS (U.S. Fish and Wildlife Service). October 2000. Benton Lake National Wildlife Refuge Wildlife List.

Western 2001. Western Area Power Administration, Construction Standards, Standard 13, Environmental Quality Protection. October.

Whitehead, R.L., 1996, Ground Water Atlas of the United States (Montana, North Dakota, South Dakota, Wyoming), U.S. Geological Survey Publication HA 730-I.

Williams, Gary D., et al. 1988 Cultural Resource Inventory: Valier-East. CRABS Document No. PN 6 23373.

Wind Hunter LLC. 2005. Valley County Wind Energy Project Application. Montana Department of Environmental Quality. Available at http://www.deq.state.mt.us/MFS/WindHunter/ValleyCoOPTpart1.pdf. Accessed July 2005.

Woods, Alan J., Omernik, James, M., Nesser, John A., Shelden, J., and Azevedo, Sandra H., 1999, Ecoregions of Montana (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Yeagley, Jim. Personal Communication August 23,2005. Contract land use planner for Glacier, Toole, and Pondera counties.

Zelenak, J.R. 1996. Breeding Ecology of Ferruginous Hawks at the Kevin Rim in Northern Montana. Master Thesis. Montana State University, Bozeman, Montana. 74 pp.

MDEQ MFSA Application Addendum A
8/11/06

Montana Alberta Tie Ltd.

Baseline Information Provided for the West Great Falls Alternative (W2)

Summary

The West Great Falls Alternative is 20.43 miles in length and provides a southwesterly option for reaching the southern terminus near Great Falls.

The following resource data tables characterize this 20 mile segment. These tables are directly comparable to those provided in the original MFSA application, and provide baseline data for physical resources (soils, water), biological resources (vegetation, wetlands, wildlife and fisheries, including threatened and endangered species), as well as social resources (land use, utilities, transportation, cultural/paleontological).

<u>4.4 Physical Resources</u>

4.4.1 Geology and Soils

As shown by **Tables 4.4-2 to 4.4-6**, a majority of this segment has highly erodible soils and less than 15 percent slopes. About 50 percent of this route crosses cretaceous shale, and 44 percent has shallow soils (depth less than 10 inches). The majority of the route segment shows only minor to minor/moderate reclamation constraints; however 4.6 miles show moderate reclamation constraints, and nearly one mile shows severe constraints.

TABLE 4.4-2
LENGTH OF EACH ALTERNATIVE CROSSING HIGHLY ERODIBLE SOILS
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Alternative	Highly Erodible (Miles)	Not Highly Erodible (Miles)	Unknown/Water (Miles)	Total (Miles)
WGF Alt.	16.63	3.77	0.04	20.43

TABLE 4.4-3
LENGTH OF EACH ALTERNATIVE CROSSING AREAS >15 PERCENT SLOPE
MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Alternative	<15 Slope (Miles)	15-30 Slope (Miles)	>30 Slope (Miles)	TOTAL (Miles)
WGF Alt.	18.94	1.46	0.03	20.43

TABLE 4.4-4 LENGTH OF EACH ALTERNATIVE CROSSING AREAS WITH SHALLOW DEPTH TO BEDROCK MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
Alternative	**Deep Soils - > 10 Inches (Miles)**	**Shallow Soils - < 10 Inches (Miles)**	**Total (Miles)**
WGF Alt.	11.56	8.87	20.43

TABLE 4.4-5 LENGTH OF EACH ALTERNATIVE CROSSING CRETACEOUS SHALE MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT			
Alternative	**Cretaceous Shale (Miles)**	**Other Bedrock Type (Miles)**	**Total (Miles)**
WGF Alt.	10.14	10.30	20.43

TABLE 4.4-6 RECLAMATION CONSTRAINTS ALONG EACH ALTERNATIVE ROUTE MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT						
Alternative	**0 – No Constraints (Miles)**	**1 – Minor Constraints (Miles)**	**2 – Minor to Moderate Constraints (Miles)**	**3 – Moderate Constraints (Miles)**	**4 - Severe (Miles)**	**5 - Severe (Miles)**
WGF Alt.	3.10	4.06	7.70	4.61	0.94	0.02

4.4.3 Water

Table 4.4-9 shows that there are no water bodies 20 acres or larger in size that occur directly along or adjacent to this alternative segment.

TABLE 4.4-9 WATER BODIES 20 ACRES IN SIZE OR LARGER ALONG TRANSMISSION LINE ALTERNATIVES MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Water Body	**West Great Falls Alt. (miles)**
PEMA	--
PEMC	--
Total	0.00

4.5 Biological Resources

4.5.1 Vegetation

As the following resource tables show, the Western Great Falls Alternative is dominated by agriculture, particularly non-irrigated farmland, and grasslands. No mature riparian forests were identified along this 20-mile corridor. There is one creek and one coulee crossed by this route segment. These include Lake Creek and Watson Coulee.

TABLE 4.5-4 LINEAR MILES OF FARMLAND AND NON-FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Land Cover[1]	**WGF Alternative**
Sprinkler-Irrigated Farmland	0.00 (0%)
Other-Irrigated Farmland	0.77 (3.8%)
Non-Irrigated Farmland	16.43 (80.4%)
Non-Farmland	3.24 (15.8%)
Total	20.43

TABLE 4.5-5 LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT		
Land Cover Type[1]	**West Great Falls Alt.**	
	Length (miles):	**Percent:**
Low/Moderate Cover Grasslands	2.53	12.4
Agricultural Lands - Irrigated[2]	3.27	16.0
Agricultural Lands - Dry[2]	13.97	68.3
Altered Herbaceous	0.00	0.0
Moderate/High Cover Grasslands	0.00	0.0
Very Low Cover Grasslands	0.00	0.0
Rock	0.00	0.0
Graminoid and Forb Riparian	0.01	0.0
Ponderosa Pine[3]	0.53	2.6
Shrub Riparian	0.03	0.2
Rocky Mountain Juniper	0.00	0.0
Mixed Mesic Shrubs	0.08	0.4
Mixed Barren Sites	0.00	0.0
Mixed Xeric Forest	0.00	0.0
Mixed Broadleaf Forest	0.00	0.0
Conifer Riparian	0.02	0.1
Salt-Desert Shrub/Dry Salt Fla	0.00	0.0
Water	0.00	0.0
Broadleaf Riparian	0.00	0.0

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.

[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.

[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

TABLE 4.5-6 ACRES OF MATURE RIPARIAN FOREST WITHN THE 1-MILE IMPACT ZONE FOR EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
West Great Falls Alternative	
Acres	**Percent of Total Impact Zone**
0.00	0.00

TABLE 4.5-9 – W2 DRAINAGES AND WATER BODIES CROSSED NORTH TO SOUTH BY WESTERN GREAT FALLS ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Water body	**River Miles[1]**
Lake Creek	8.25 miles
Watson Coulee	6.40 miles

The West Great Falls Alternative between Great Falls and 3 miles south of Dutton traverses the old floor of Glacial Lake Great Falls. In a few places the old lake shorelines are visible as a distinct little scarp rising above a narrow bench. Native grassland communities along the West Great Falls Alternative have been highly reduced and fragmented due to agricultural land uses. The most expansive area of natural vegetation occurs in Lake Creek Flats. This area is saline supporting alkali grass (*Puccinellia* spp.), foxtail barley (*Hordeum jubatum*), greasewood (*Sarcobatus vermiculatus*), saltwort (*Salicornia rubra*) and Pursh seepweed (*Suaeda calceoliformis*). South of where the alternative traverses in an east-west direction are steep slopes too steep to cultivate and hence native grassland. This area is characterized by a needlegrass-wheatgrass community.

4.5.2 Wetlands

NWI data indicate that there is one palustrine wetland along this 20 mile route segment. There are no Waterfowl Production Areas within a mile of this route.

TABLE 4.5-12 LINEAR MILES OF WETLANDS ALONG THE TRANSMISSION LINE ALTERNATIVES MONTANA ALBERTA TIE, LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
West Great Falls Alt.	
Wetland Class	**Length (Miles)**
PEMA	0.24
PEMC	0.00
Total Wetlands	0.24
U	20.20
No Data	0.00
Total Length of Alternative	20.43

TABLE 4.5-13 WATER BODIES 20 ACRES IN SIZE OR LARGER ALONG TRANSMISSION LINE ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Water Body	**West Great Falls Alt. (miles)**
PEMA	--
PEMC	--
Total	0.00

4.5.3 Wildlife and Fisheries

As shown in **Table 4.5-20** below, the Western Great Falls Alternative crosses 2.73 miles of known mule deer winter range. Table **4.5-24** shows that this 20 mile segment also passes through 3.2 miles of Ferruginous Hawk habitat range, 2.6 miles of Black-crowned Night-heron habitat and 2.6 miles of Black-necked stilt habitat range.

TABLE 4.5-20 LINEAR MILES OF MULE DEER WINTER RANGE CROSSED BY EACH ALTERNATIVE MONTANA ALBERTA TIE. LTD.
West Great Falls Alt.
2.73

TABLE 4.5-24 LINEAR MILES OF SPECIAL STATUS SPECIES' HABITAT RANGE ALONG EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT		
Common Name	**State Rank**	**WGF Alternative**
Ferruginous Hawk	S2B	3.18
Black-crowned Night-heron	S3B	2.62
Black-necked stilt	S3, S4B	2.57
All species (minus overlaps)	--	5.80

On the 11th of May 2006, a burrowing owl was observed sitting on a fence post on the north side of Gunderson Rd., approximately 1.5 miles west of Love Rd.

4.6 Social Resources

4.6.2 Land Use

As **Table 4.6-6** shows, land jurisdiction and ownership consist primarily of private lands, with approximately two miles in state ownership.

According to NRCS soil data, less than 23 percent of lands along this route alternative are classified as Prime Farmland or Farmland of Statewide Importance. In looking at other data sources, CAMA data (**Table 4.6-7b**) and GAP Analysis (**Table 4.6-7c**) indicate that a majority of the lands along this line are non-irrigated farmlands, non-farmlands and/or grasslands. Further, more refined, orthophoto analysis (**Table 4.6-8**) shows that approximately 36 percent of the land coverage along this route is dry farmland and approximately 63 percent is grassland.

Linear miles of lands under federal/state special management and those lands currently under federal or state conservation easements are shown on **Table 4.6-9**. This includes nearly two miles of DNRC State School Trust Lands, and nearly nine miles of CRP lands.

The West Great Falls alternative comes within a mile of 50 developed residential locations, eight developed commercial locations and two developed industrial locations. This route is also very near to the Bootleger Subdivision.

TABLE 4.6-6
LAND JURISDICTION/OWNERSHIP ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

	West Great Falls Alt.	
Owner	**Miles**	**Percent**
U.S. Dept. of Defense	0.00	0.0
Right of Way	0.13	0.6
State Government	1.97	9.6
Private	18.33	89.7
Total	20.43	100.0

Source: Montana State Library/NRIS

TABLE 4.6-7a OCCURANCE OF PRIME FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES (MILES) MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Land Cover	**WGF Alternative**
Prime Farmland (if irrigated)	0.52 (2.5%)
Farmland of Statewide Importance	4.13 (20.2%)
Other	15.78 (77.2%)
Total	20.43

Based on analysis of NRCS Soil Data

TABLE 4.6-7b LINEAR MILES OF FARMLAND AND NON-FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Land Cover[1]	**WGF Alternative**
Sprinkler-Irrigated Farmland	0.00 (0%)
Other-Irrigated Farmland	0.77 (3.8%)
Non-Irrigated Farmland	16.43 (80.4%)
Non-Farmland	3.24 (15.8%)
Total	20.43

TABLE 4.6-7c LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT		
Land Cover Type[1]	**West Great Falls Alt.**	
	Length (miles):	**Percent:**
Low/Moderate Cover Grasslands	2.53	12.4
Agricultural Lands - Irrigated	3.27	16.0
Agricultural Lands - Dry	13.97	68.3
Altered Herbaceous	0.00	0.0
Moderate/High Cover Grasslands	0.00	0.0
Very Low Cover Grasslands	0.00	0.0
Rock	0.00	0.0
Graminoid and Forb Riparian	0.01	0.0
Ponderosa Pine	0.53	2.6
Shrub Riparian	0.03	0.2

TABLE 4.6-7c LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT		
Land Cover Type[1]	**West Great Falls Alt.**	
	Length (miles):	**Percent:**
Rocky Mountain Juniper	0.00	0.0
Mixed Mesic Shrubs	0.08	0.4
Mixed Barren Sites	0.00	0.0
Mixed Xeric Forest	0.00	0.0
Mixed Broadleaf Forest	0.00	0.0
Conifer Riparian	0.02	0.1
Salt-Desert Shrub/Dry Salt Fla	0.00	0.0
Water	0.00	0.0
Broadleaf Riparian	0.00	0.0

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

TABLE 4.6-8 ORTHO-PHOTO ANALYSIS OF LINEAR MILES OF LAND COVER TYPES ALONG TRANSMISSION LINE ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Land Cover[1]	**WGF Alternative**
Dry Farmland	7.43 (36.4%)
Riparian	0.15 (0.7%)
Wetland/Water	0.03 (0.2%)
Open/Grassland	12.83 (62.8%)
Total	20.43

Based on GIS orthophoto analysis, March 2006

TABLE 4.6-9 LINEAR MILES OF FEDERAL/STATE SPECIAL MANAGEMENT AREAS AND CONSERVATION EASEMENTS ALONG EACH ALTERNATIVE	
	WGF Alternative
Montana State Trust Land (DNRC)	1.96 miles
Conservation Easements[1] (Total)	8.91 miles (CRP)

TABLE 4.6-10 DEVELOPED RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL AREAS WITHIN 1 MILE OF EACH ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
	West Great Falls Alt.
Developed Residential[1]	72
Developed Commercial & Industrial Strutures[2]	181

[1] Source: CAMA and orthophoto analysis
[2] Source: CAMA and orthophoto analysis

TABLE 4.6-11 MAJOR PUBLIC BUILDINGS, FARM SUPPORT BUILDINGS, AND FENCE LINES WITHIN 1 MILE OF EACH OF THE ALTERNATIVES MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Data	**West Great Falls Alt.**
Schools[1]	0
School-owned property[2]	0
Major Public Buildings[2]	0
Major Farm Support Buildings (within ½ mile)[2]	0
Fence Lines Greater than ¼ mile long[3]	24 miles

[1]Source: Montana Department of Administration (MTDA)
[2]Source: CAMA
[3]Source: Ortho-photo analysis

4.6.3 Utilities and Transportation

This route crosses two highways along its 20 mile length. These include Highway 225 (Bootlegger Trail) and US Highway 87 (Havre Highway).

TABLE 4.6-15 – W2 U.S. AND STATE ROADWAYS CROSSED OR PARALLELED BY WEST GREAT FALLS ALTERNATIVE MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT	
Roadway	**Jurisdiction**
Bootlegger Trail (Hwy 225) - state and secondary highway	Montana Department of Transportation
U.S. Highway 87 - Havre Highway	Montana Department of Transportation

The West Great Falls Alternative crosses or parallels 9 local roads or city streets; and crosses railroads 0 times. There are no unpaved private airstrips within 1 mile of the West Great Falls Alternative. The route parallels/follows the WAPA 230-kV transmission line for all but the northern most 2.5 miles of its length. There are 37 point communication facilities are within 1 mile of The West Great Falls Alternative. Finally, based on publicly available shapefiles from Montana DEQ, the route does not cross any coil pipelines.

4.6.7 Cultural Resources

Paleontological Baseline

Geologic formations within the Study Area with potential to harbor significant fossils include the Two Medicine Formation. Other formations with low to moderate probability of harboring fossils include the Eagle, Kootenai, Madison, and Virgelle. The remaining formations or geologic types within the Study Area have little or no potential to contain fossils. Areas within the Two Medicine, Eagle, Kootenai, Madison, and Virgelle formations with potential to harbor fossils primarily occur on steep exposed slopes above major river channels.

There is little or no potential for fossils along this route segment.

TABLE 4.6-21e
Geologic Units Along West Great Falls Alternative (W2)

Geologic Unit	Miles	Percent
Bootlegger Member of Blackleaf Formation	6.88	33.7
Glacial Lake Deposit	6.78	33.2
Vaughn Member of Blackleaf Formation	2.72	13.3
Floweree Member of Marias River Formation	1.84	9.0
Taft Hill Member of Blackleaf Formation	1.42	6.9
Glacial Till, Older	0.54	2.6
Alluvium of Modern Channels and Flood Plains	0.25	1.2

APPENDIX T

MDEQ Supplemental Information Request Summaries

1. ARM 17.20.815 (6). Design capacity and operational characteristics

MDEQ Statement: *Supplemental Information Request*: While information is provided on the pole structure, the application needs to include a discussion of the design capacity and operational characteristics of the line and other components such as series capacitors, phase shifting transformers, and other substation equipment.

Response to MDEQ (Response on 3/30/06): The design criteria of the MATL project are (as of 3/3/06):

- Path Rating: 300MW both directions.
- Emergency Rating: 320MW.
- Future capacity: 350MW (with additional capacitors at Cut Bank).
- Voltage control: 100% to 110% operational.
- Voltage limit: 115% high limit at Cut Bank open circuit.
- WECC reliability criteria applies.

Basic design (See **Appendix H** of the Application for the MATL System Single Line Diagram (rev. 12)). This diagram is provided for information only. The basic design of the system is in development and will be finalized when the WECC power flow studies and interconnection agreements are complete. To date the base design is for:

- New 240-kV Substation north of Lethbridge.
- Alberta System additions include a breaker and a half scheme interconnection to the existing Alberta Electrical Interconnected System (AEIS). System components to be designed and built by AltaLink LLP, the regional utility.

MATL system consists of:

- 150MVAr of shunt capacitors and associated breakers for voltage control.
- A phase shifting transformer (PST) to control power flow. PST is rated at 330MVA and steps down the voltage from 240kV on the Alberta side to 230kV on the Montana side.
- A line breaker for transmission line protection.
- Additional space is allocated for future expansion of transmission lines.
- Control building with associated control equipment, complete with back up DC control power.
- New 230-kV Substation in Cut Bank next to the Glacier Electric Coop 115-kV substation.
- Substation includes a transmission line segmenting breaker for the protection of the transmission line.
- 150 MVAr of shunt capacitors and associated breakers for voltage control.

- Station is designed for ring bus configuration to accommodate future growth namely interconnection to the Glacier Electric Coop. 115-kV system and potential wind farm connections.
- MATL and Glacier Electric are in discussions involving sharing the existing Glacier Electric control building.
- T interconnection 6.25 miles south of the Cut Bank Substation for Great Plains Wind Energy.
- In coordination with Great Plains Wind Energy, a T interconnect and line side breaker is planned.
- Interconnection into existing Great Falls 230-kV substation.
- Interconnection into existing Great Falls substation to be designed and built by NorthWestern Energy.
- Feasibility study indicated that the existing breaker and a half bus will be extended to accommodate the MATL line.

2. Circular MFSA-2 Section 3.0 (c) Selection of alternative locations

MDEQ Statement: *Supplemental Information Request*: Describe how preferred location criteria listed in Section 3.1.1 of Circular MFSA-1 were used to select alternative locations as required in Section 3.2.2(b).

Response to MDEQ: (Response on 3/16/06) This information was provided and incorporated into Section 4.3 of the Application satisfying, *MFSA-2, 3.0 (c), 3.1.1-11; MFSA-2, 3.2.2b; MFSA-2, 3.2.4; and MFSA-2, 3.5.1a, b.*

3. Circular MFSA-2 Section 3.2.2(c) – Cost

MDEQ Statement: *Supplemental Information Request*: Describe roughly how much additional cost would be incurred if a location from Cut Bank to Shelby to Great Falls were selected.

Response to MDEQ (Response on 3/30/06): This option is materially longer, with additional river crossing expense The additional length of this option would be approximately 29 kilometers at about $116,400 per kilometer (includes conductor, construction, and structural costs) or $3.376 million in total, plus a new substation cost at Shelby estimated to be about $6 million.

4. Circular MFSA-2 Section 3.2.3 – Basemap and Electronic Submittal

MDEQ Statement: *Supplemental Information Request*: Provide shape files or geodatabases for map information submitted in the application

Response to MDEQ (Delivered on 3/17/06) – A CD of all updated shape files was provided to DEQ on March 17, 2006.

5. Circular MFSA-2 Number: 3.4(7)(d) Social Characteristics

MDEQ Statement: ***Supplemental Information Request:*** For races and ethnicities listed n tables on pages 96-105, identify whether any map be differentially affected by the proposed project.

Response to MDEQ (Response on 1/11/06): (differentially affected races or ethnicities):
Please see *Environmental Justice (pg. 146)* for a discussion of potential for differential impacts to low income and/or minority populations. Under *Criteria 1*: none of the alternatives negatively affect low income or minority populations in a disproportionate manner to the surrounding communities or region. Under *Criteria 2*: none of the project alternatives would disproportionately reduce the ability of low-income or minority persons to make a living in the Project Study Area, and under *Criteria 3*: due to MATL's avoidance of and mitigation of impacts to cultural resources, there would be no significant impacts to Native American cultural or religious sites resulting from implementation of any of the alternatives.

6. Circular MFSA-2 Number: 3.4(9) Landscape Aesthetics

MDEQ Statement: ***Supplemental Information Request*****:** The applicant may consider contracting with the department to provide a more complete description for the MFSA report.

Response to MDEQ: MDEQ will complete visual analysis.

7. Circular MFSA-2 Section 3.5.1 (d) – Cost, reliability, and engineering concerns.

MDEQ Statement: ***Supplemental Information Request***: Although cost and engineering concerns were apparently used to eliminate alternatives, it is unclear how they were used to develop the three alternatives carried forward in the application. Describe the alternative development process further.

Response to MDEQ (Response on 3/30/06)
The three chosen alternatives were carried forward due to:

- The location of the Marias and Teton River crossings: The chosen alternatives create the least amount of impact; and were sited in locations deemed to be more feasible from an engineering perspective.
- The alternatives chosen were the most perpendicular to existing agricultural operations/practices (i.e. addressed landowner concerns) and were thereby more feasible.
- The alternatives all have comparatively shorter lengths (thereby resulting in less cost)
- These three alternatives are most western and therefore are closer to potential wind development opportunities

8. Circular MFSA-2 Section 3.5.1 (e) – Other factors important to applicant.

MDEQ Statements:

(1) ***Supplemental Information Request:*** Approximately how much additional cost is necessary to meet engineering challenges involved with the Marias River breaks south of Shelby? Note that Western Area Power Administration's 230-kV line crosses the Marias River south of Shelby.

(2) ***Supplemental Information Request***: Explain why crossing land administered by the U.S. Bureau of Land Management (BLM) is a concern. Crossing of BLM land is mentioned on page 29 of the application. Also, note that under Section 75-20-301(1)(h), MCA, DEQ must make a finding that the use of public lands for location of the facility was evaluated and that public lands were selected whenever their use is as economically practicable as the use of private lands.

(3) ***Supplemental Information Request***: On page 29 of the application, MATL identified difficulties with an alignment between Cut Bank and Shelby because this alignment diagonally traversed dry-land cereal cropland. How does this diagonal crossing of cropland differ from that along the proposed location?

Responses to MDEQ (Response on 3/30/06):

(1) The additional length of this option would be approximately 29 kilometers. This distance at about $116,400 per kilometer (includes conductor, construction, and structural costs) equals about $3.376 million in total. In addition, a new substation at Shelby would be estimated to cost about $6 million.

(2) The alternatives no longer avoid BLM land. BLM land is being crossed north of the Marias River.

(3) The verbiage in the application related to the alignment between Cut Bank and Shelby should be taken out. The reason to avoid Cut Bank to Shelby to Great Falls is the extra length and cost to cross the Marias River south of Shelby.

9. Circular MFSA-2 Section 3.6.6 – Tabulation of the amount, type and or linear miles of areas mapped in Section 3.7 and 3.8

MDEQ Statement *Supplemental Information Request*: Tabulations in the application indicate that the project is either 126 miles long or 166, a discrepancy of about 40 miles. Clarify the discrepancy. Select a single preferred location.

Response to MDEQ: Addressed in March 30, 2006 Submittal (as Appendix) and with shape files submitted in March 17, 2006**.**

10. Circular MFSA-2 Section 3.6.7 (b) – Reclamation and maintenance methods

MDEQ Statement: *Supplemental Information Request*: Provide a proposed reclamation plan that DEQ could use as a starting point for a reclamation plan that would be included in environmental specifications for the project by ARM 17.20.1607(1)(a), (vii)(d), and (viii)(c).

Response to MDEQ: Draft Reclamation Plan was submitted with June 9th, 2006 deficiency response.

11. Circular MFSA-2 Section 3.6.7 (c) – Localized location adjustments

MDEQ Statement: ***Supplemental Information Request*:** During the scoping meetings a number of localized alternative location adjustments were suggested to avoid potentially significant impacts to farming practices. DEQ wishes to work with MATL and landowners in these areas to find locations that minimize impacts while considering costs. We should schedule a meeting in January to discuss these localized routing alternatives.

Response to MDEQ (March 30, 2006): MATL met with MDEQ in January 2006 and addressed location concerns at that time. The alternatives have been re-routed since then, again, to address landowner concerns. MATL believes they have addressed this Supplemental Information Request; see also revised route maps as of 24 February 2006.

12. Circular MFSA-2 Section 3.6.7 (d) – Seasonal timing of construction

MDEQ Statement: ***Supplemental Information Request***: As presented at the public scoping meetings, construction is proposed for summer and fall 2006. However, MATL also briefly mentioned the possibility of construction extending into winter. Describe how winter construction methods would differ from more common warm weather construction and how impacts may change as a result of winter construction.

Response to MDEQ (March 30, 2006): In most cases, by starting construction in fall/winter, crops have been harvested from fields; thus resulting in less impact to agriculture; also, there is no irrigation at this time. Typically land is frozen so there will be minimal potential for soil erosion and compaction, and rutting of land is minimized. The exception would be in areas planted with winter wheat – these areas would either be avoided or the landowner would be compensated.

13. Circular MFSA-2 Section 3.6.7 (f) – Alternative methods of crossing streams

MDEQ Statement: ***Supplemental Information Request***: MATL did not apply for any permits to conduct construction in streams. Describe your proposed construction methods that would avoid all in stream construction activities.

Response to MDEQ (March 30, 2006): MATL will not plant any pole structures below the normal high-water mark. As far as stringing the line is concerned, if construction occurs during summer/fall months it may be possible to utilize a boat to string the line across a water body. If construction occurs during the winter months, clear-span bridges could be utilized when a stream is dry or frozen (See MATL's Environmental Protection

Plan, December 2005). Small watercourses could possibly be forded if sufficiently frozen, or where fording conditions are not available, other potential options include portable bridge placement or use of existing access routes. Water crossing construction will be postponed if any excessive flows or flood conditions are present or anticipated.

14. Circular MFSA-2 Section 3.7.2- Baseline Data

MDEQ Statement: ***Supplemental Information Request***: On the Land Use/Cover Baseline overlays color symbols for US Fish and Wildlife Service Conservation Easements obscure and overwhelm the pale green symbol for dry cropland. Consequently, DEQ staff cannot distinguish the underlying land uses. Provide the shape files used to compile the mylar overlays rather than providing a new set of overlays.

Response to MDEQ (Response on 3/30/06): Shapefiles were submitted with updated colors on March 17, 2006.

15. Circular MFSA-2 Section 3.7.2n - Cropland

MDEQ Statement: ***Supplemental Information Request*****:** Mapping of mechanically irrigated land was submitted with the application but is so imprecise that it is not useful for locating transmission lines and needs to be redone after field checking. We believe non-irrigated land is indicated as irrigated, some irrigated land was mapped as non-irrigated based on comments received at scoping meetings, and center-pivots are crossed by at least one alternative. Land enrolled in the conservation reserve program is typically not irrigated as indicated on Figure E6-a.

Response to MDEQ (Response on 3/17/06): Shape files were submitted on March 17, 2006.

16. Circular MFSA-2 Section 3.7.2s - Pipelines

MDEQ Statement: ***Supplemental Information Request*****:** Re-map pipelines because the mapped pipelines do not line up with known pipeline locations. Also, note that DEQ has never mapped pipelines at a scale close to 1:24,000. Also, note that the old pipeline coverage created from 1:250,000 source materials dated 1981 has not been updated and new pipelines have been constructed since that time.

Response to MDEQ: Per MDEQ statement, this information will be gathered by MDEQ while the environmental document is prepared.

17. Circular MFSA-2 Section 3.7.4 – Assessment of impacts on agricultural, residential, commercial, industrial, mining, and public land uses.

MDEQ Statement: ***Supplemental Information Request***: Redo, update, and resubmit land use mapping based on field investigations. CAMA date is too general for site specific location studies. After mapping is updated, recalculate values in Table 4.6-7 and 4.6-8. Then rewrite the land use impact analysis.

Response to MDEQ (Response on 3/30/06): This information was provided in the March 17th electronic GIS submittal. Additional information is also provided below within the context of a portion of the application's Existing Land Use (4.6.2) section:

Existing Land Use

Prime farmland exists in the Study Area only when irrigated or where there is a permit to irrigate. Overall, there are 373,219 acres (25.8%) of prime farmland, and 515,848 acres (35.7%) of farmland of statewide importance within the project area. Preferred Alternative A and B cross a similar number of miles of prime farmland and farmland of statewide importance, while Alternative C passes through a relatively higher percentage (See Table 4.6-7a).

TABLE 4.6-7a
OCCURANCE OF PRIME FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES (MILES)
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover	Preferred A	Alternative B	Alternative C
Prime Farmland (if irrigated)	32.53 (24.8%)	32.99 (26.5%)	43.86 (32.1%)
Farmland of Statewide Importance	42.09 (32.1%)	43.83 (35.2%)	46.64 (34.2%)
Other	56.5 (43.1%)	47.61 (38.3%)	45.99 (33.7%)
Total	131.12	124.43	136.49

Based on analysis of NRCS Soil Data

In general, the land along Preferred Alternative A appears to be dominated by agriculture (94%) interspersed with patches of non-farmland mostly in the form of low to moderate cover grasslands. With the exception of grazing land near the Marias and Teton rivers, coulees and drainages, this route is estimated to primarily be composed of non-irrigated farmland and to a lesser extent irrigated farmland (**Table 4.6-7b)**. Non-irrigated cropland and irrigated cropland is the principal land use along Preferred Alternative A, although livestock grazing and CRP are present as well.

TABLE 4.6-7b
LINEAR MILES OF FARMLAND AND NON-FARMLAND ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover[1]	Preferred A	Alternative B	Alternative C
Sprinkler-Irrigated Farmland	16.38 (12.5%)	15.73 (12.6%)	12.63 (9.3%)
Other-Irrigated Farmland	0.66 (0.5%)	1.72 (1.4%)	4.16 (3%)
Non-Irrigated Farmland	106.48 (81.2%)	97.61 (78.4)	111.22 (81.5%)
Non-Farmland	7.6 (5.8%)	9.37 (7.6%)	8.48 (6.2%)
Total	131.12	124.43	136.49

[1]Source: Water permits submitted to the Montana DEQ and data from computer assisted mass appraisal (CAMA). CAMA is a computer-aided analysis of data describing property characteristics that is used in establishing property values for tax assessment.

Among the crops grown on irrigated land, the most common are alfalfa and small grains such as wheat and barley. Non-irrigated cropland (dryland agriculture) comprises the bulk of cultivated land along Preferred Alternative A and is generally found on the adjacent uplands. Principal crops include cereal grains developed to be drought resistant. Not all the acres devoted to dryland agriculture are planted each year. Much of the land is cultivated under an alternate crop-fallow system.

GAP analysis data (**Table 4.6-7c**) predict that non-timbered grassland or rangeland comprises approximately 41 percent of Preferred Alternative A. Based on field investigations and further ortho-photo review, non-timbered grassland and rangeland is predominantly located near the Marias and Teton rivers, and along coulees and drainages. As observed during field investigations, forested lands along Preferred Alternative A occur predominantly as cottonwood gallery forest along the Marias and Teton Rivers and comprise less than 1 percent of Preferred Alternative A

TABLE 4.6-7c
LINEAR MILES OF NON-FARMLAND COVER TYPES ALONG EACH ALTERNATIVE
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover Type[1]	Preferred Alternative A		Alternative B		Alternative C	
	Length (miles):	Percent:	Length (miles):	Percent:	Length (miles):	Percent:
Low/Moderate Cover Grasslands	47.83	36.5	40.32	32.4	39.68	29.1
Agricultural Lands - Irrigated	37.62	28.7	38.21	30.7	40.17	29.4
Agricultural Lands - Dry	31.20	23.8	35.71	28.7	40.47	29.7
Altered Herbaceous	4.97	3.8	2.45	2	6.54	4.8
Moderate/High Cover Grasslands	2.86	2.2	1.03	0.8	1.74	1.3
Very Low Cover Grasslands	2.76	2.1	2.55	2	2.43	1.8
Rock	1.03	0.8	0.9	0.7	0.9	0.7
Graminoid and Forb Riparian	0.82	0.6	1.28	1	1.32	1
Ponderosa Pine	0.60	0.5	.59	0.5	1	0.7
Shrub Riparian	0.51	0.4	.11	0.1	0.22	0.2
Rocky Mountain Juniper	0.39	0.3	0.2	0.2	0	0.0
Mixed Mesic Shrubs	0.19	0.1	0.29	0.2	0.75	0.6
Mixed Barren Sites	0.12	0.1	0.21	0.2	0.06	0.0
Mixed Xeric Forest	0.08	0.1	0.17	0.1	0.17	0.1
Mixed Broadleaf Forest	0.06	0.0	0.04	0.0	0.26	0.2
Conifer Riparian	0.04	0.0	0.38	0.3	0.47	0.3
Salt-Desert Shrub/Dry Salt Fla	0.03	0.0	0.0	0.0	0.17	0.1
Water	0.0	0.0	0.0	0.0	0.04	0.0
Broadleaf Riparian	0.0	0.0	0.0	0.0	0.1	0.1

[1] Source: Montana GAP Analysis data (Fisher et al. 1998) was used to quantify the land cover types of the non-farmland cover within the study area. Based on ortho-photo analysis and field investigations, the GAP data values are not accurate. The GAP data is presented here to illustrate the *relative abundance* of non-farmland cover types.
[2] The GAP Analysis estimate of agricultural lands differs from the CAMA values for agricultural lands given in Table 4-1. As described under "Methods" the GAP data dates back to 1993, whereas the CAMA data is updated approximately weekly and is therefore more accurate than the GAP data. GAP data is presented here because it is the only source for non-farmland cover estimates in Montana.
[3] These cover types were not observed during field investigations within the study area. The satellite images and spectral reflectivity used to identify different land-cover types for the GAP Analysis may have been interpreted/predicted incorrectly.

Additional Analysis: Based on additional orthophoto analysis, the prime farmland data (Table 4.6-7a), the CAMA data (shown in Table 4.6-7b) and the GAP analysis data (shown in Table 4.6-7c) over-estimate, in particular, the mileage of irrigated farmland along each route. More precise orthophoto analysis of recent aerial photography determined that Preferred Route A observably crosses only .11 miles of irrigated farmland (.1 percent) instead of the CAMA estimate of 13 percent, and the GAP prediction of 28 percent. This more accurate, photo-based percentage of irrigated cropland is consistent with MATL's intent to avoid irrigated cropland where possible.

The orthophoto analysis also identified that Preferred Route A crosses 86.43 miles or (66 percent) of dry farmland. Preferred Route A also crosses approximately 41 miles (31 percent) of open/grassland, .04 miles of forest, 2.57 miles (2 percent) of riparian areas and 1.04 miles (.8 percent) of water/wetlands. In general this analysis concluded that more open/grassland and less irrigated and dry farmland is crossed, under all alternatives, than what the CAMA data estimated in Table 4.6-7b. Complete orthophoto analysis results for all route options are provided in Table 4.6-8

TABLE 4.6-8
ORTHO-PHOTO ANALYSIS OF LINEAR MILES OF LAND COVER TYPES ALONG TRANSMISSION LINE ALTERNATIVES
MONTANA ALBERTA TIE LTD., LETHBRIDGE, AB – GREAT FALLS, MT

Land Cover[1]	Preferred A	Alternative B	Alternative C
Dry Farmland	86.43 (65.9%)	88.02 (70.7%)	93.43 (68.5%)
Irrigated Farmland	0.11 (0.1%)	1.60 (1.3%)	2.00 (1.5%)
Wetland/Water	1.04 (0.8%)	0.26 (0.2%)	0.17 (0.1%)
Open/Grassland	40.93 (31.2%)	32.48 (26.1%)	38.66 (28.3%)
Riparian	2.57 (2.0%)	1.98 (1.6%)	1.96 (1.4%)
Forest	0.04 (0.0%)	0.09 (0.1%)	0.27 (0.2%)
Total	131.12	124.43	136.49

Based on GIS orthophoto analysis, March 2006

18. Circular MFSA-2 Section 3.7.4b: Assessment of Impacts to Areas identified in (a) and in response to Circular MFSA Sections (3.7) (2) through (6) and (3.7) (8) through (19) and cross-referenced

MDEQ Statement: ***Supplemental Information Request:*** In Tables 4.5-7, 4.5-8, and 4.5-9 do you mean drainages crossed rather than water bodies crossed? If so, correct the titles of these tables.

Response to MDEQ: Changed in Text of Application

19. Circular MFSA-2 Section 3.7.9(b) – Engineering of the facility in each alternative location. (b) Alternative structure types and technologies

MDEQ Statement: ***Supplemental Information Request:*** Provide appropriate drawings and a description of a single pole 230 kV design. This description should include the categories listed in Tables 5.2-1, 4.6-17, 4.6-18, and 4.6-19. Drawings equivalent to Figures 4-2, 4-3, and Figures 5-1 through 5-5. If information in Table 5.2-2 is different for a single pole design, information equivalent to that in Table 5.5-2 should be provided. Lastly, provide an estimate of cost for a single pole 230 kV design.

APPENDIX T

Response to MDEQ (Response on 3/30/06): Single Pole Draws comparable to Figures 4-2, 4-3 and Figures 5-1 to 5-5 are provided as with the revised application. Additions to relevant tables are provided below:

Additions to Tables 4.6-17 to 19:

TABLE 4.6-17
AUDIBLE NOISE (AN) EFFECT
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Pole Type	Distance from Centerline (feet)	Audible Noise (dBA) (L_{50})
H-frame Double Pole	100	46.23
	52.33	49.56
Single Pole	100	47.13
	54	50.00
	30.18	52.48

TABLE 4.6-18
RADIO INTERFERENCE (RI) AND TELEVISION INTERFENCE (TVI) EFFECT
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Pole Type	Distance from Center Line (feet)	Radio/Television	Frequency (MHz)	Interference (dBuV/m) (L_{50})
H-frame Double Pole	120 (100 ft from outside conductor)	RI	0.5	33.7
			0.834	30.2
			1	28.7
			1.25	26.7
			1.5	24.9
			2	21.8
		TVI	75	19.8
Single Pole	120 (100 ft from outside conductor)	RI	0.5	39.8
			0.834	36.3
			1	34.8
			1.25	32.8
			1.5	31.1
			2	28.1
		TVI	75	21.43

TABLE 4.6-19b
EMF EFFECTS
MONTANA ALBERTA TIE, LTD.
LETHBRIDGE, AB – GREAT FALLS, MT

Single Pole Structure	Location	Distance from Center Line (feet)	Electric Field (KV/m)	Magnetic Field (mG)
NESC Ground Clerance: 19.72 ft.	Below Conductor	8.66	4.989	175.12
	RoW Edge	10.17	4.985	171.178
	Safety Zone	30.18	1.730	80.905
	Guidance Limit	39	1.005	55.936

APPENDIX T

Additions to Table 5.2-1:

TABLE 5.2-1 (a) TYPICAL DESIGN CHARACTERISTICS (Monopole) MONTANA ALBERTA TIE, LTD. LETHBRIDGE, AB – GREAT FALLS, MT	
Design Element	**Characteristic**
Line Length (approximate)	130 miles
Right-of-Way (ROW) Width	105 feet operational
Thermal Capacity for 230-kV line	420 Megavolt Ampere (MVA)
Nominal Voltage	230,000 volts (230 kV)
Conductor Size	1033 MCM Curlew
Conductor Type	ACSR
Overhead Ground Wire	3/8-inch diameter galvanized
Electric field at edge of ROW	4.985 kV/m
Magnetic field at edge of ROW	171.178 mG
Electrostatic short-circuit current limit	5 milliampere (mA)
Structure Height	Steel-pole monopole: 80' – 100' (90' average)
Length of Span	Steel-pole monopole: 455' typical 500' maximum span
Minimum Ground Clearance of Conductor	19.72' @ 60^{o} Fahrenheit
Typical Structure Base Dimensions	Steel-pole monopole: 3.5' diameter round
Land temporarily disturbed per site for conductor reel and pole storage yards	2 –3 acres
Area required for each structure base	Steel-pole monopole: 10 sq. ft.

Estimated cost of single pole design would be approximately 25 percent more than the H-frame design.

20. Circular MFSA-2 Section 3.7.9– Engineering of the facility in each alternative location.

MDEQ Statement: ***Supplemental Information Request***: Figures 5-1 to 5-5 are not legible due to poor quality scans. Please re-label the numbers on these figures.

Response to MDEQ (Response on 3/30/06): AMEC has provided MDEQ with legible copies of these figures as part of the revised application.

21. Circular MFSA-2 Section 3.7.10(a)

MDEQ Statement: *Supplemental Information Request*: Clarify the location of the Class B Visual Quality Area shown on Figure E-11e. Is Class B scenery meant to follow the Teton River or a combination of river bottom and upland areas?

Response to MDEQ: MDEQ will complete visual analysis.

22. Circular MFSA-2 Section 3.7.10(f) Viewer Characteristics

MDEQ Statement: Supplemental information request: Provide ADT for major travel routes identified on page 128, paragraph 4.

Response to MDEQ (Response on 3/30/06): According to the most recent available Montana Department of Transportation statistics for automatic traffic recorder sites, Station A61 along I-15 south of Shelby had an average daily traffic count of 2,781 vehicles in 2004. Interstate 15 just north of Great Falls had an average daily traffic count of 8,530 at Station A9. Route 89 just north of the junction with Hwy 534 (station A39) had an average daily traffic count of 400 vehicles in 2004.

23. Circular MFSA-2 Number: 3.7(12)(b)(xxi) Mature Riparian Forests

MDEQ Statement: ***Supplemental Information Request*:** Although riparian forest is mapped, it is unclear whether the criteria in this rule were used to delineate riparian stands. Please clarify this point.

Response to MDEQ (Response on 1/11/06): The mature riparian forest mapped on the Land Use/Cover baseline overlays (Figures E-1a to E-14a) were delineated using the criteria defined in the MFSA-2 Circular. Thus, the mature riparian forest delineated on the overlays are stands of cottonwood or mixed cottonwood-conifer forests greater than 300 feet long and 30 feet wide where average canopy height is 50 feet or more and average density of mature trees is greater than 20 stems per acre.

24. Circular MFSA-2 Section 3.7.19(e) – An assessment of the potential impacts of the electrical and magnetic fields generated by the facility.

MDEQ Statement: ***Supplemental Information Request***: Describe cause and degree of impact that could occur to GPS systems installed in farm equipment and measures MATL proposes to implement that would eliminate this adverse affect. Also, describe the cause and degree of impact that could occur if the proposed line were located too close to a pipeline.

Response to MDEQ (Response on 6/9/06): Potential interference could occur to certain types of GPS systems installed in farm equipment. If an issue arises, MATL proposes to mitigate this effect by supporting upgrades to improve the GPS system's resistance to interference. One potential solution is to upgrade the unit to be compatible with the Wide Area Augmentation System (WAAS). WAAS provides a more extensive coverage area and is less susceptible to signal interference.

25. ARM 17.20.1509 #6. Radio and television interference and EMF

MDEQ Statement: ***Supplemental Information Request***: Please clarify electric and magnetic field strengths at the edge of the ROW. Page 159 indicates a ground clearance of 32 feet at 60 degrees Fahrenheit while page 134 indicates field strengths calculated assuming a ground clearance of 19.72 feet. What is the minimum proposed ground clearance and what are the corresponding electric and magnetic field strengths? If applicable, what are the field strengths at the property boundaries of substations in residential and subdivided areas? If different from information in Table 5.2-1, provide specifications for design peak voltage and amperage under adverse climatic conditions under expected peak loading conditions.

Response to MDEQ (Response on 3/30/06: The minimum proposed ground clearance of the conductor is 19.72 feet based on the National Electric and Safety Code (NESC). The electric and magnetic field strengths at the edge of the ROW (22.47 ft) are 5.871 KV/m and 248.757 mG, respectively. The EMF effects at the edge of the safety zone (52.33 ft) are 1.522 KV/m and 69.374 mG, respectively. In terms of electric and magnetic field strengths at the property boundaries of substations in residential and subdivided areas; AMEC called NorthWestern Energy and Glacier Electric to ask about the field strengths of their substations. This information was not available from either entity.

26. ARM 17.20.1510 #2. Construction Disturbance

MDEQ Statement: ***Supplemental Information Request***: How much ground disturbance is anticipated at representative pulling and tensioning sites?

Response to MDEQ (Response on 3/30/06): Ground disturbance associated with pulling and tensioning sites: 10,000 square feet every 2 miles, which will vary depending on terrain (WAPA 230 kV).

27. ARM 17.20.1510 #4. Min and max ROW

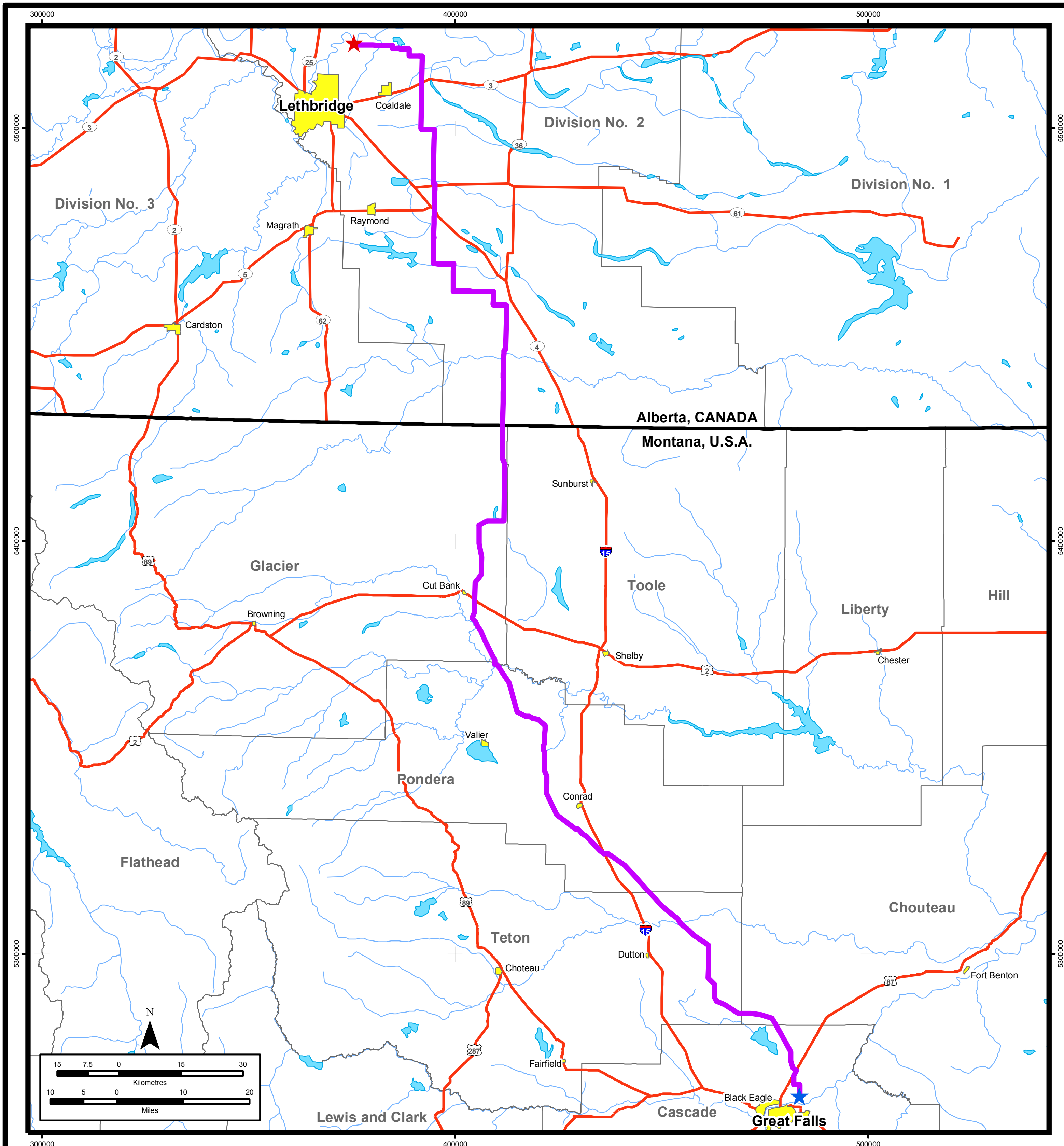
MDEQ Statement: ***Supplemental Information Request:*** At angle structures what is the proposed maximum ROW width? Would any temporary easement be purchased for construction outside the 105' permanent easement?

Response to MDEQ (Response on 3/30/06): The maximum width at a dead-end 90 degree three-pole structure would require approximately 18,000 square feet of ROW. Any part of this area that is disturbed would be reclaimed. A temporary easement would be purchased for construction outside the 105-foot permanent easement.

28. ARM 17.20.1510 #6. Reclamation methods

MDEQ Statement: ***Supplemental Information Request***: Provide a more detailed description of proposed reclamation measures and the timing of these measures (see page 161).

Response to MDEQ (Response on 6/9/06): A Draft Reclamation Plan was submitted with June 9th, 2006 deficiency response.



Legend

- Proposed Transmission Route
- MATL Owned Substation
- NorthWestern Energy Substation
- Cities / Towns
- Highways
- Lakes
- Rivers

Montana Alberta Tie Ltd.

Project Location

DATE: August 2005	PROJECTION: UTM Zone 12	DATUM: NAD83
JOB No: CE03202		
GIS FILE: Transmission Routes	**Figure 1-1**	
PDF FILE: Transmission Routes 08-09-06		

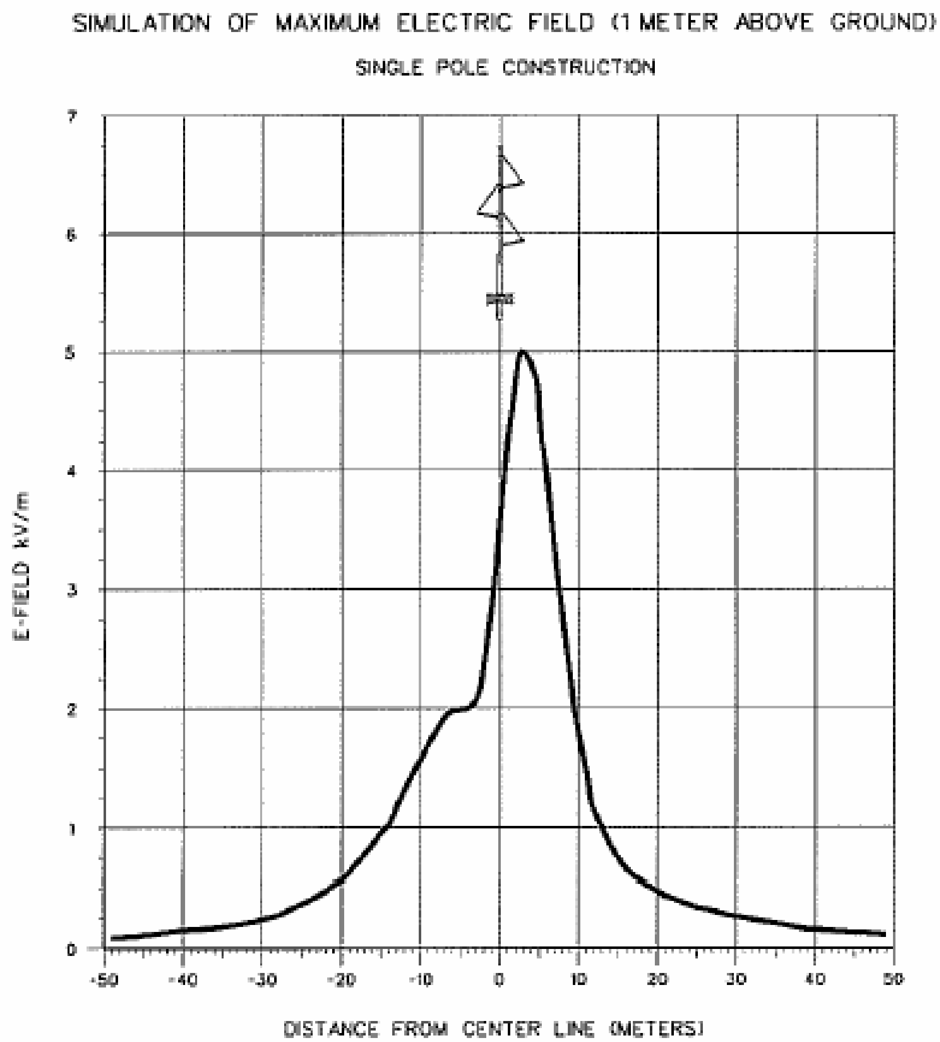
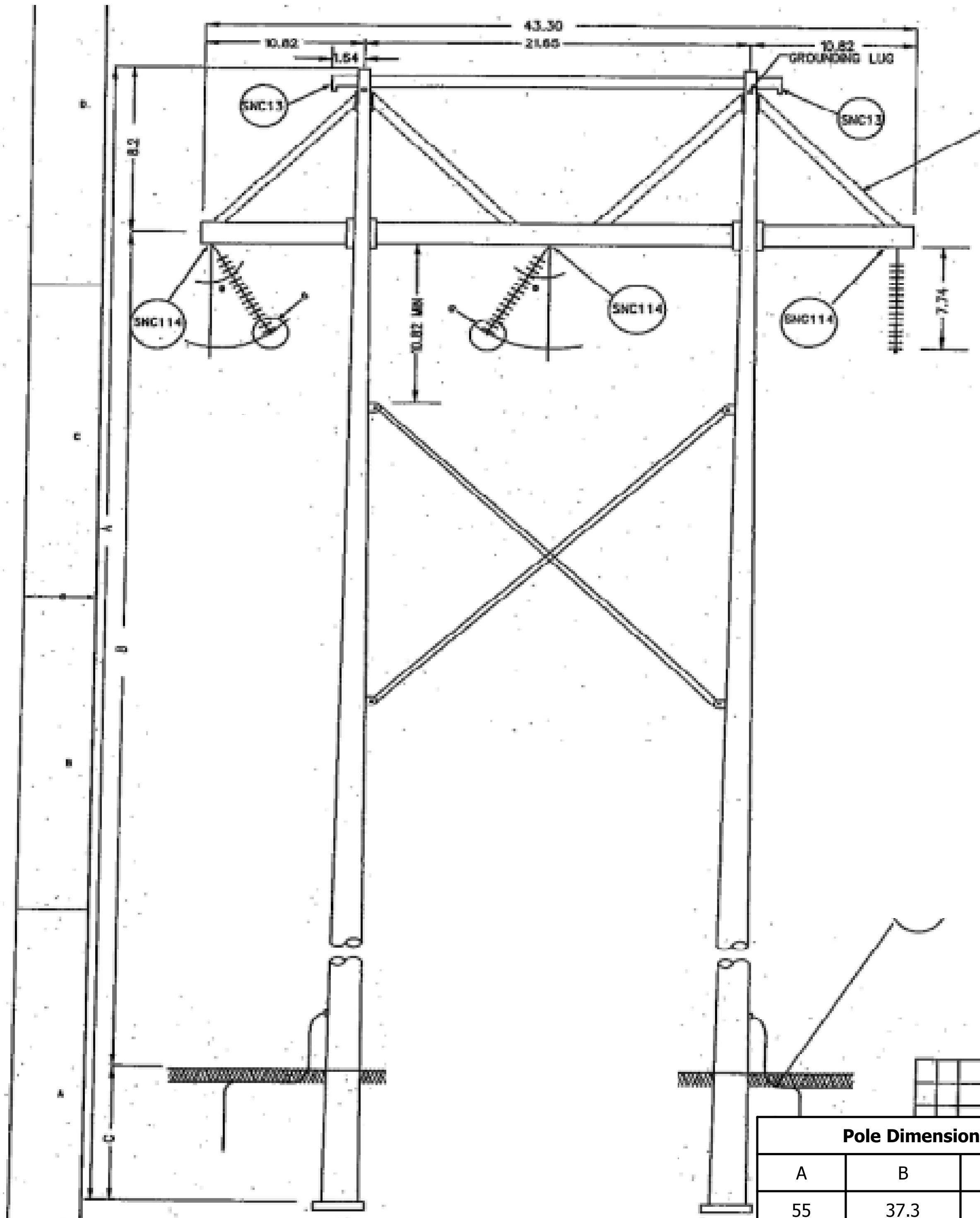


Figure 4-4
Simulation of Maximum Electric Field (1 Meter Above Ground) – Single Pole Construction

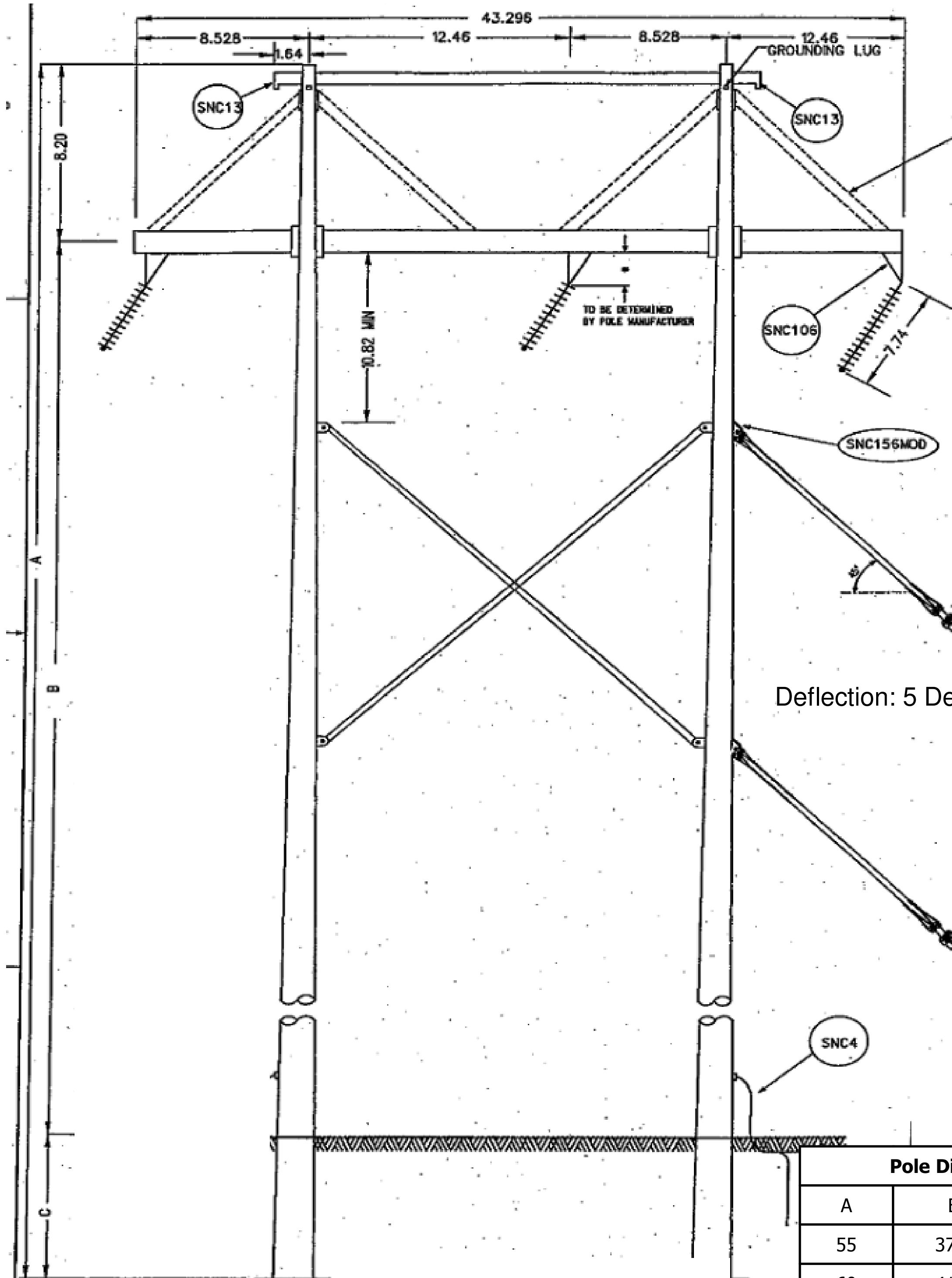


H-Frame ROW Detail		
Pole Location	ROW Distance (feet)	Safety Zone Distance (feet)
County Road ROW	30.9	30
Outside County Road ROW	37.46	30
Through Farmers Field	45	30 (either side of ROW)

Deflection: 1 Degree Line Angle

Pole Dimensions		
A	B	C
55	37.3	9.5
60	41.8	10
65	46.3	10.5
70	50.8	11
75	55.3	11.5
80	59.8	12
85	64.3	12.5
90	68.8	13

Figure 5-1
240kV H-Frame Tangent Structure

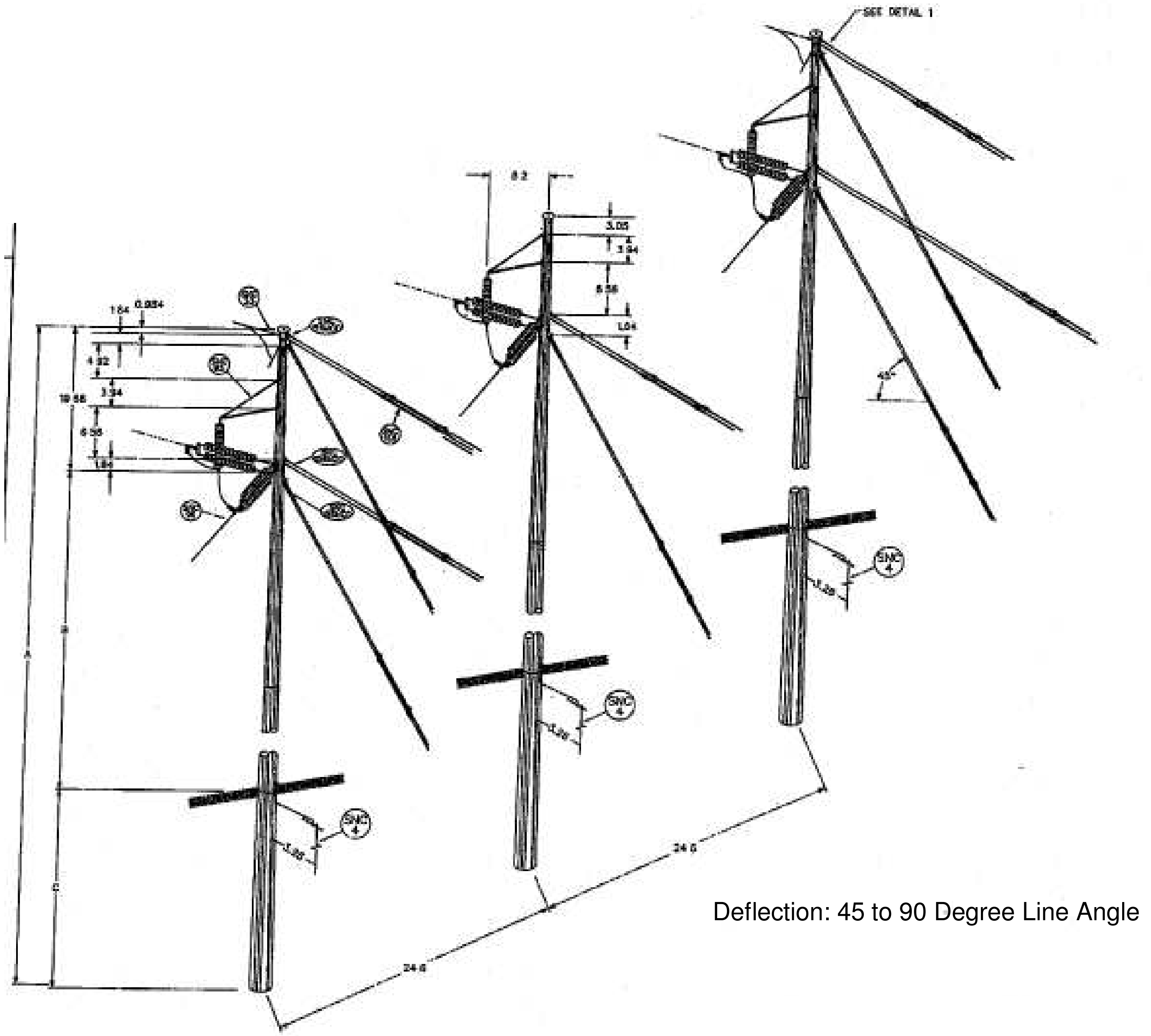


Deflection: 5 Degree Line Angle

H-Frame ROW Detail		
Pole Location	ROW Distance (feet)	Safety Zone Distance (feet)
County Road ROW	30.9	30
Outside County Road ROW	37.46	30
Through Farmers Field	45	30 (either side of ROW)

Pole Dimensions		
A	B	C
55	37.3	9.5
60	41.8	10
65	46.3	10.5
70	50.8	11
75	55.3	11.5
80	59.8	12
85	64.3	12.5
90	68.8	13

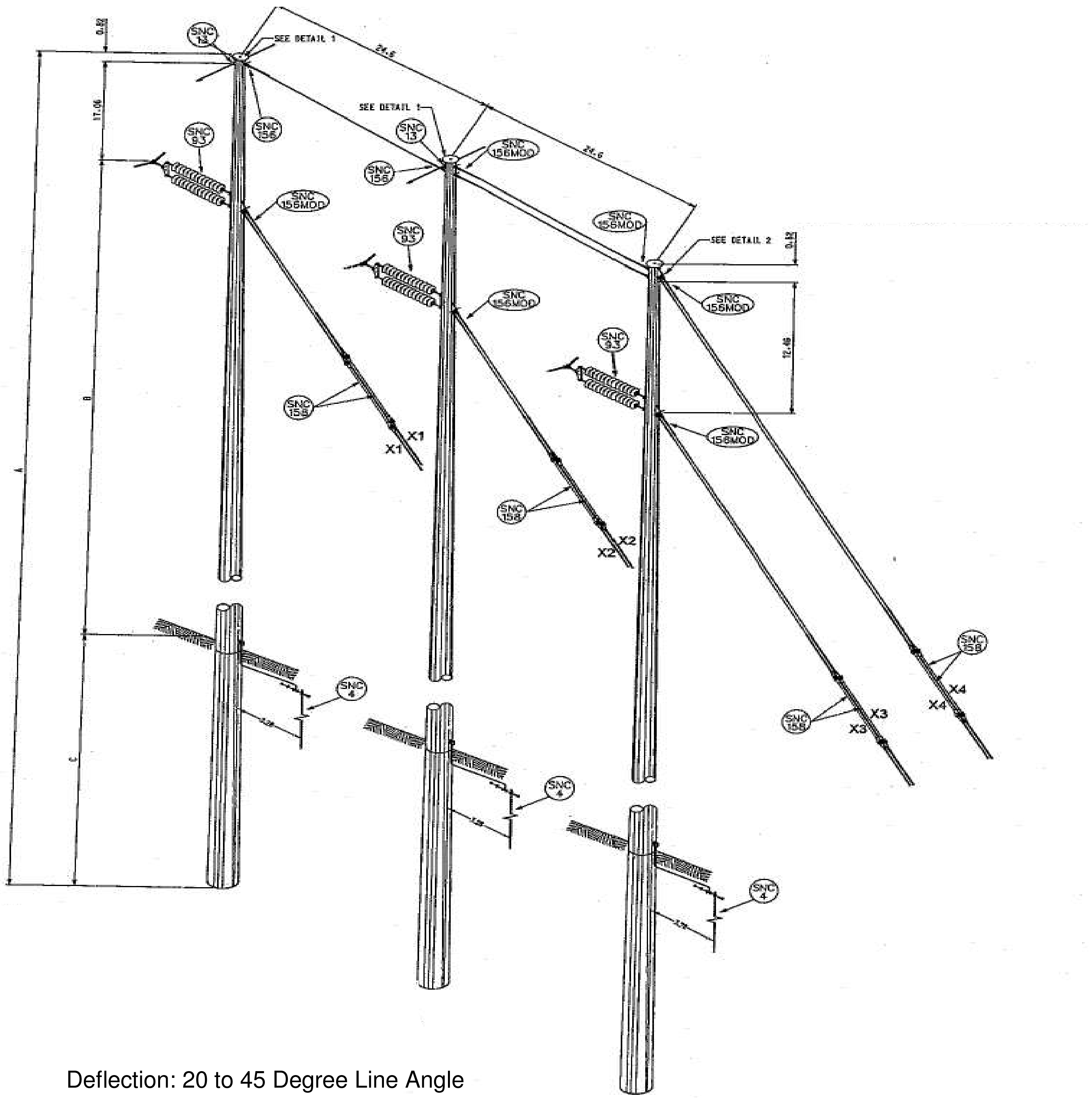
Figure 5-2
240kV H-Frame Light Angle Structure



Deflection: 45 to 90 Degree Line Angle

Pole Dimensions		
A	B	C
60	30.62	10
65	34.82	10.5
70	39.32	11
75	43.82	11.5
80	48.32	12

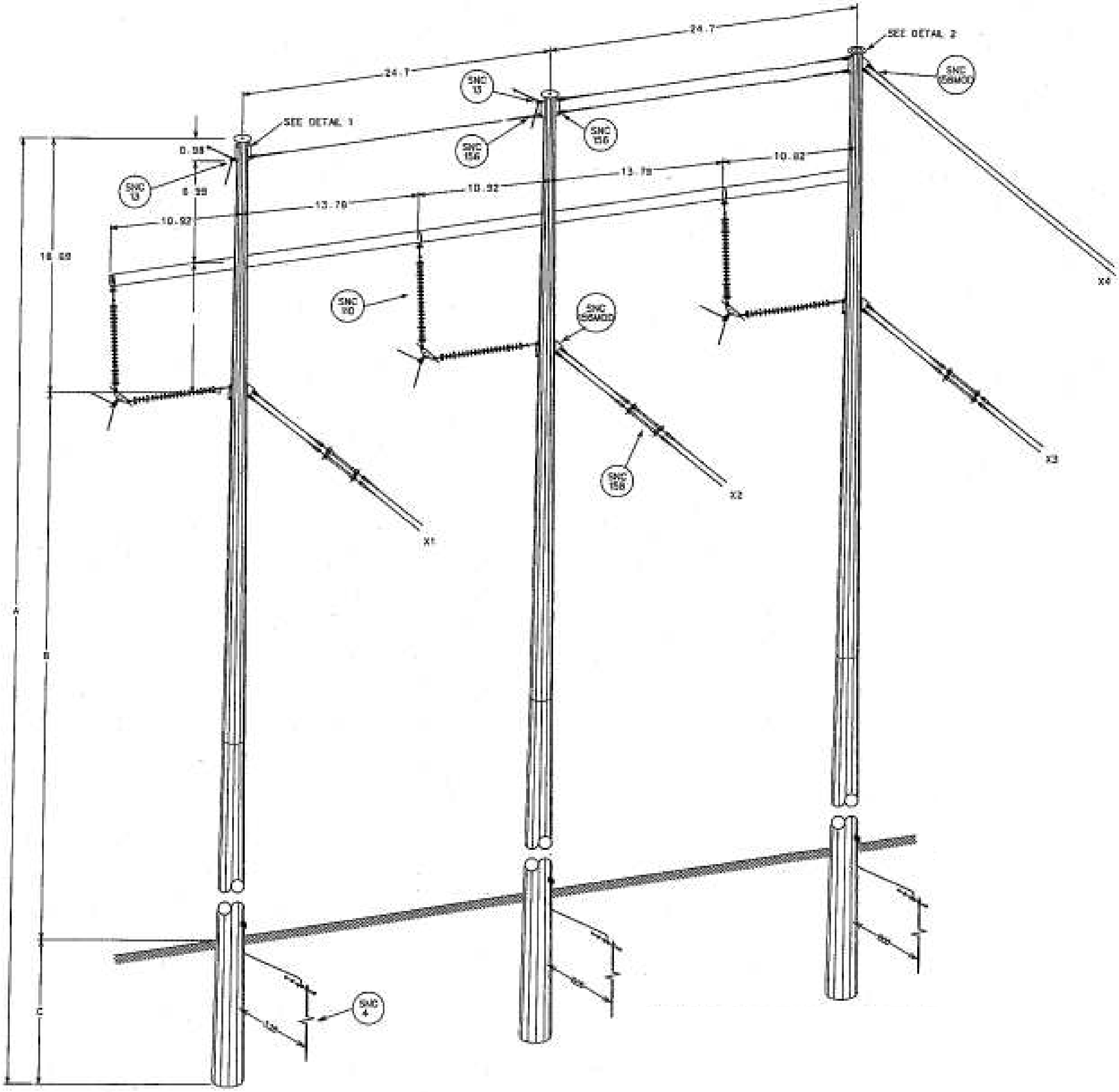
Figure 5-3
240kV Three Pole Dead-End Structure



Deflection: 20 to 45 Degree Line Angle

Pole Dimensions		
A	B	C
65	36.62	10.5
70	41.12	11
75	45.62	11.5
80	50.12	12
85	54.62	12.5

Figure 5-4
240kV Three Pole Heavy Angle Structure



Deflection: 5 to 20 Degree Line Angle

Pole Dimensions		
A	B	C
75	48.78	11.5
80	51.28	12
85	55.81	12.5
90	80.3	13

Figure 5-5
240kV Three Pole Medium Angle Structure

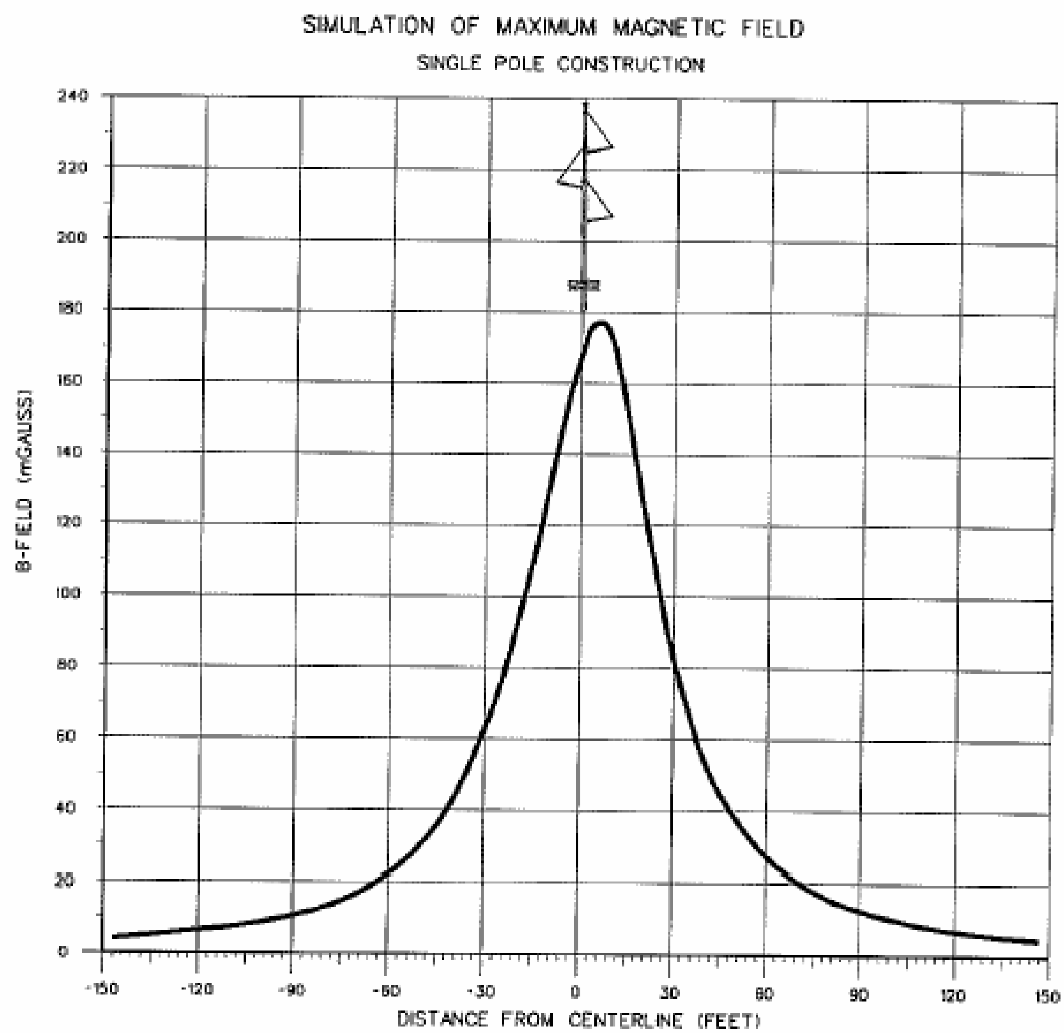
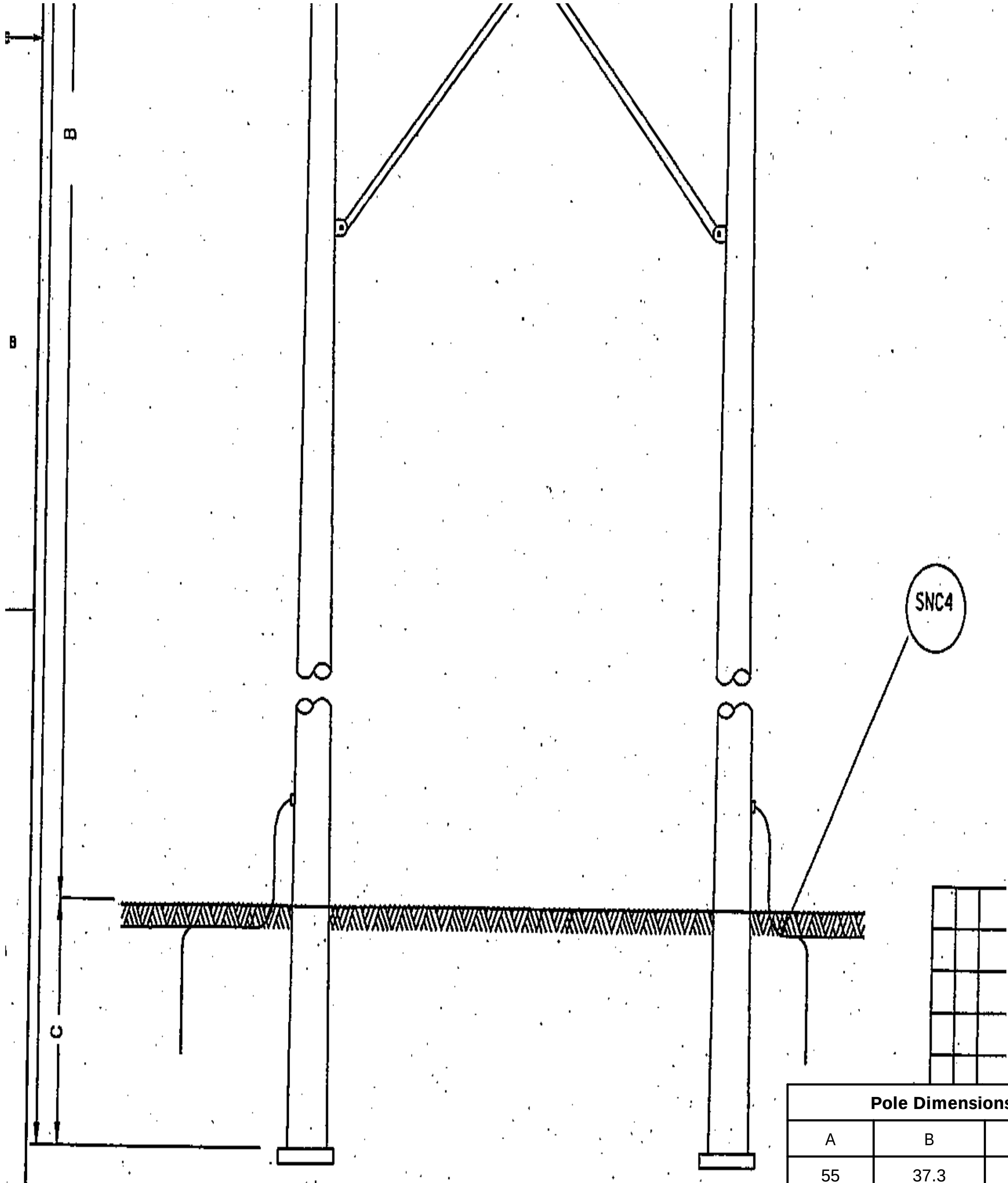


Figure 4-5
Simulation of Maximum Magnetic Field – Single Pole Construction

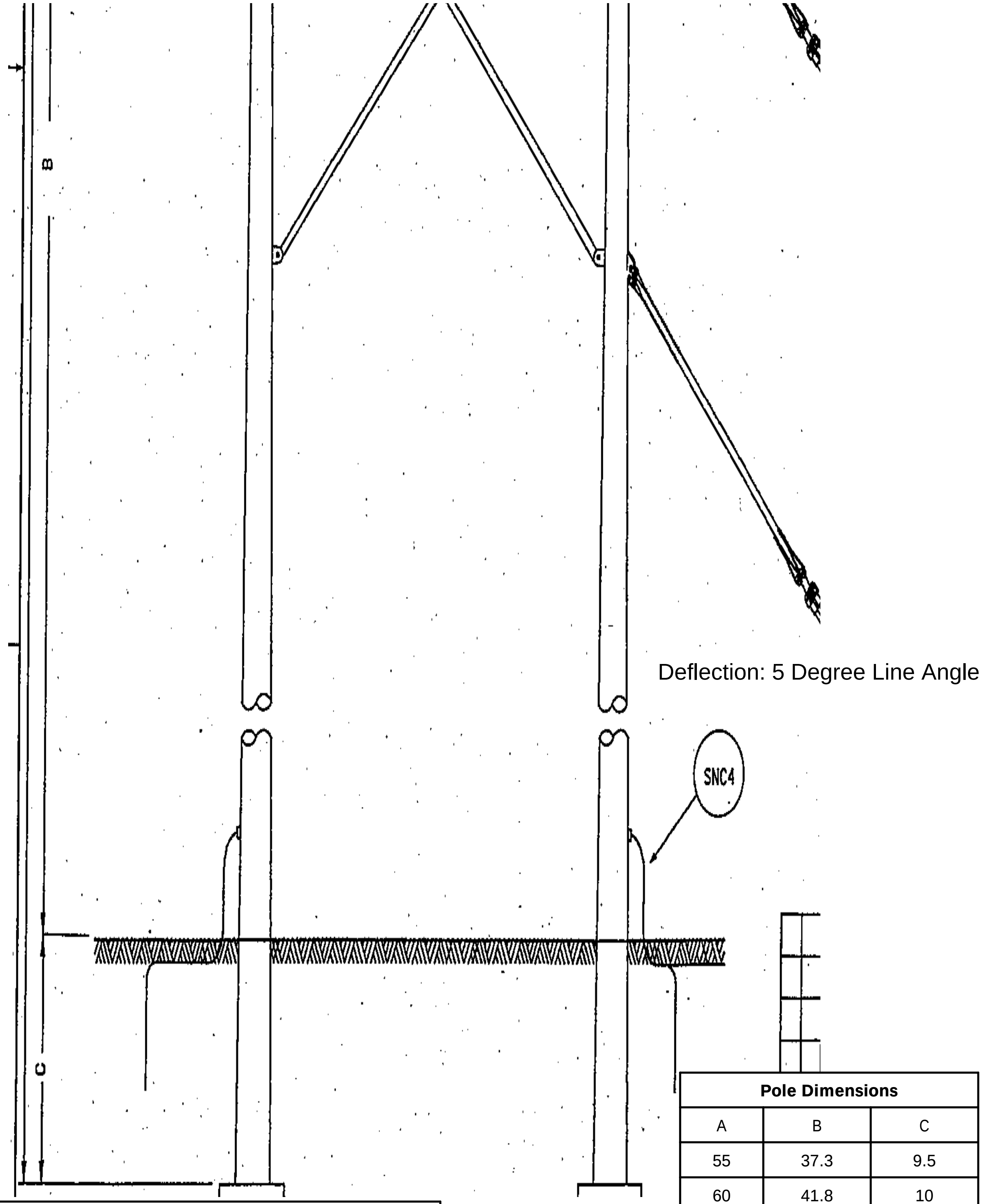


H-Frame ROW Detail		
Pole Location	ROW Distance (feet)	Safety Zone Distance (feet)
County Road ROW	30.9	30
Outside County Road ROW	37.46	30
Through Farmers Field	45	30 (either side of ROW)

Deflection: 1 Degree Line Angle

Pole Dimensions		
A	B	C
55	37.3	9.5
60	41.8	10
65	46.3	10.5
70	50.8	11
75	55.3	11.5
80	59.8	12
85	64.3	12.5
90	68.8	13

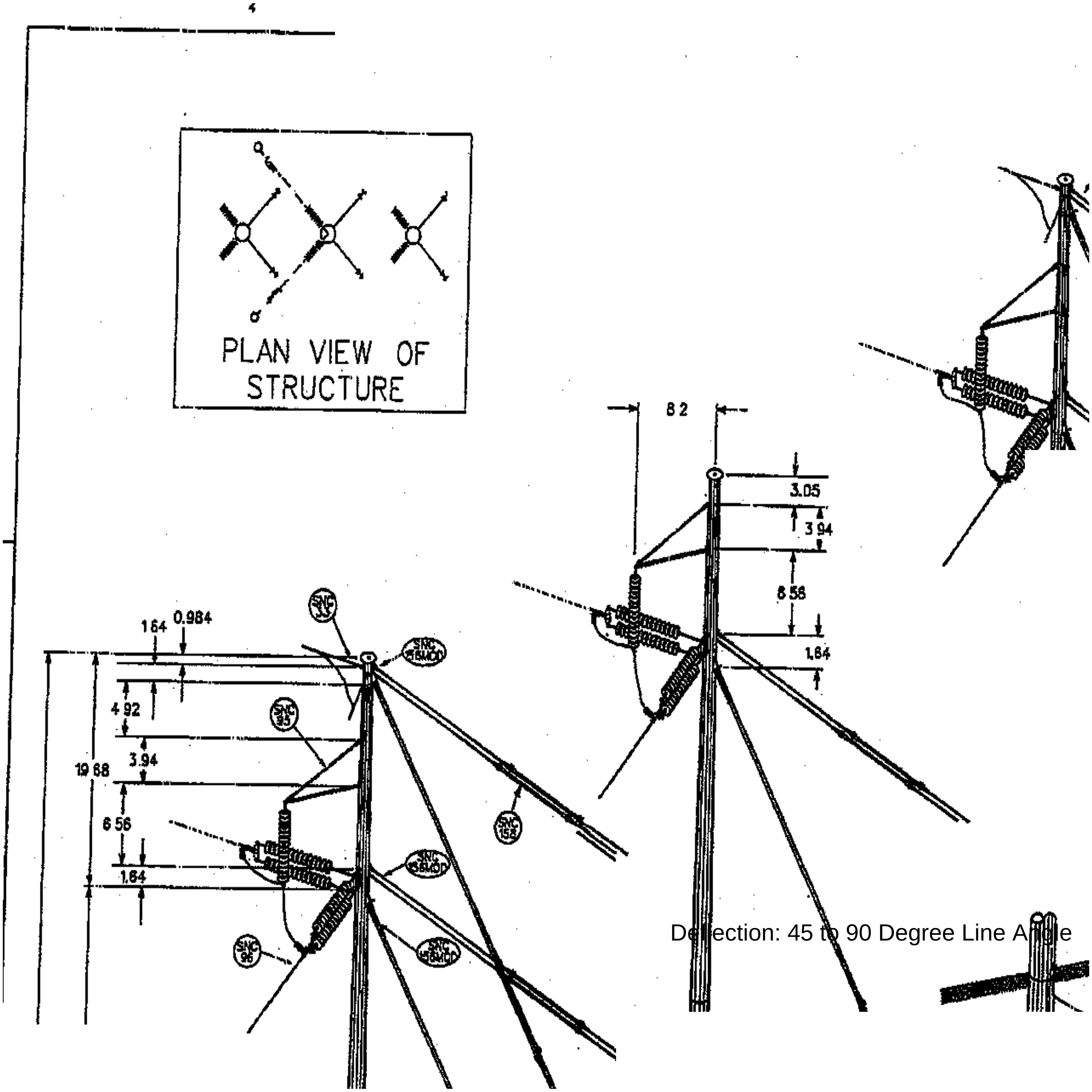
Figure 5-1
240kV H-Frame Tangent Structure



H-Frame ROW Detail		
Pole Location	ROW Distance (feet)	Safety Zone Distance (feet)
County Road ROW	30.9	30
Outside County Road ROW	37.46	30
Through Farmers Field	45	30 (either side of ROW)

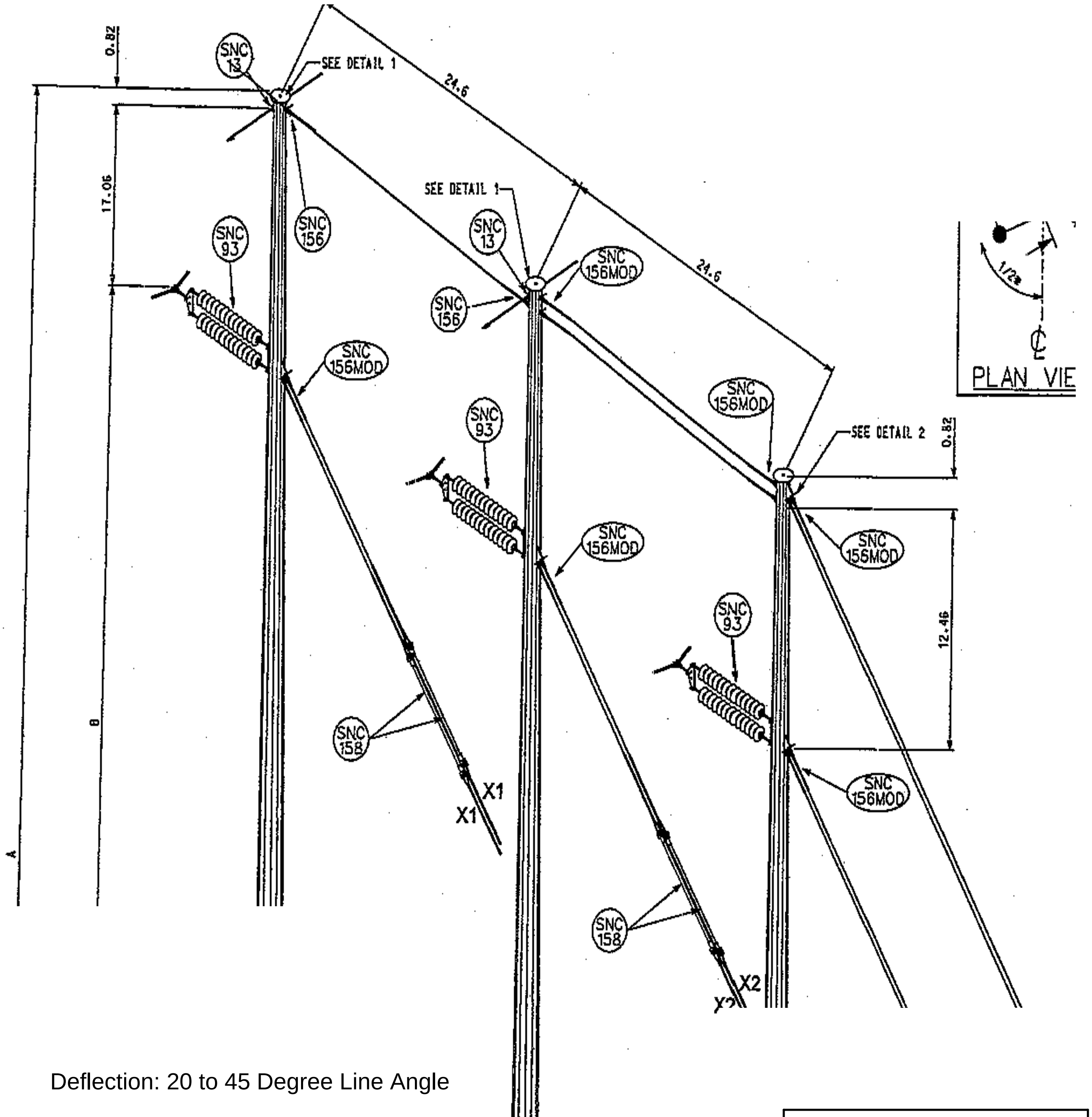
Pole Dimensions		
A	B	C
55	37.3	9.5
60	41.8	10
65	46.3	10.5
70	50.8	11
75	55.3	11.5
80	59.8	12
85	64.3	12.5
90	68.8	13

Figure 5-2
240kV H-Frame Light Angle Structure



Pole Dimensions		
A	B	C
60	30.62	10
65	34.82	10.5
70	39.32	11
75	43.82	11.5
80	48.32	12

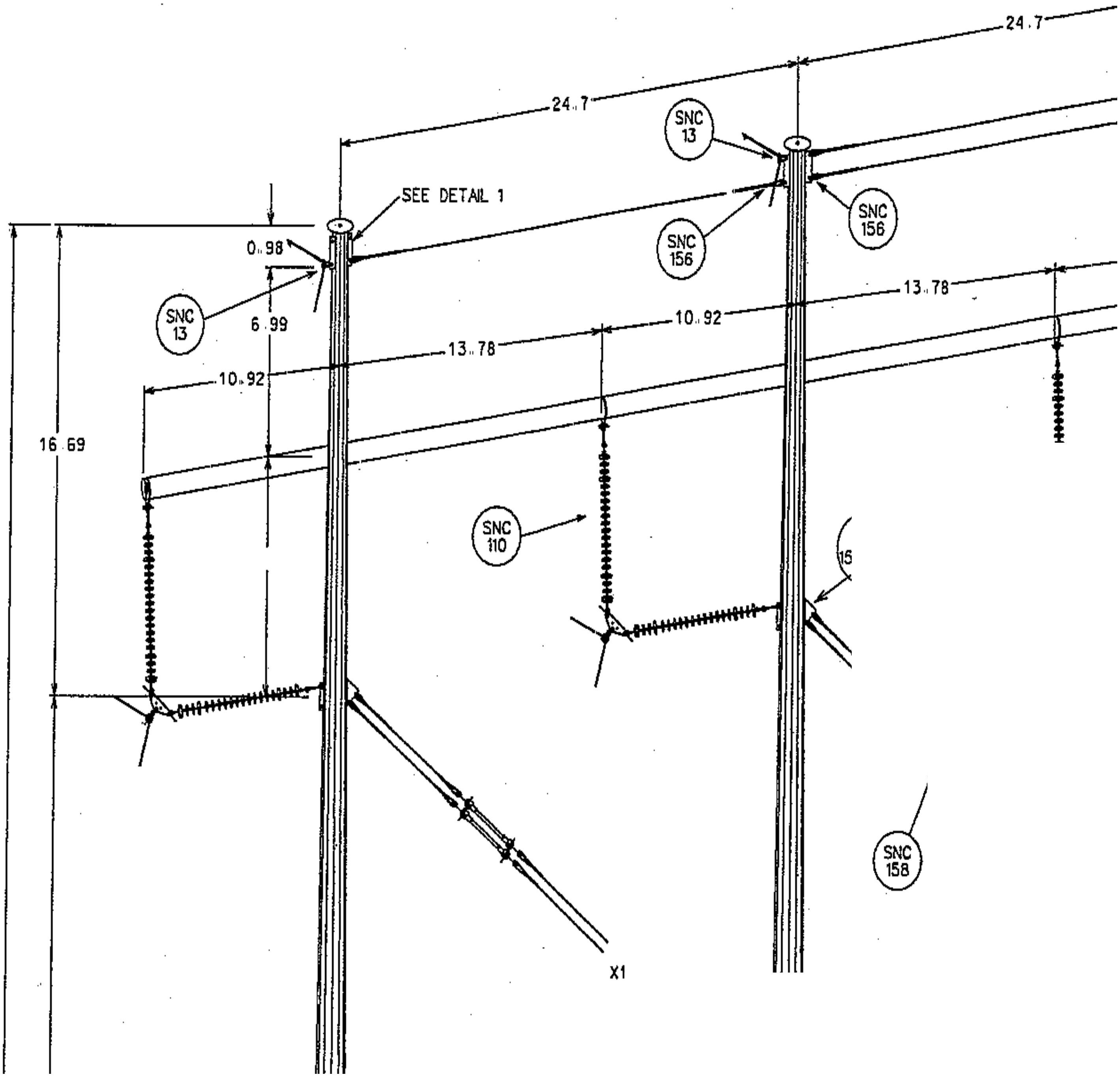
Figure 5-3
240kV Three Pole Dead-End Structure



Deflection: 20 to 45 Degree Line Angle

Pole Dimensions		
A	B	C
65	36.62	10.5
70	41.12	11
75	45.62	11.5
80	50.12	12
85	54.62	12.5

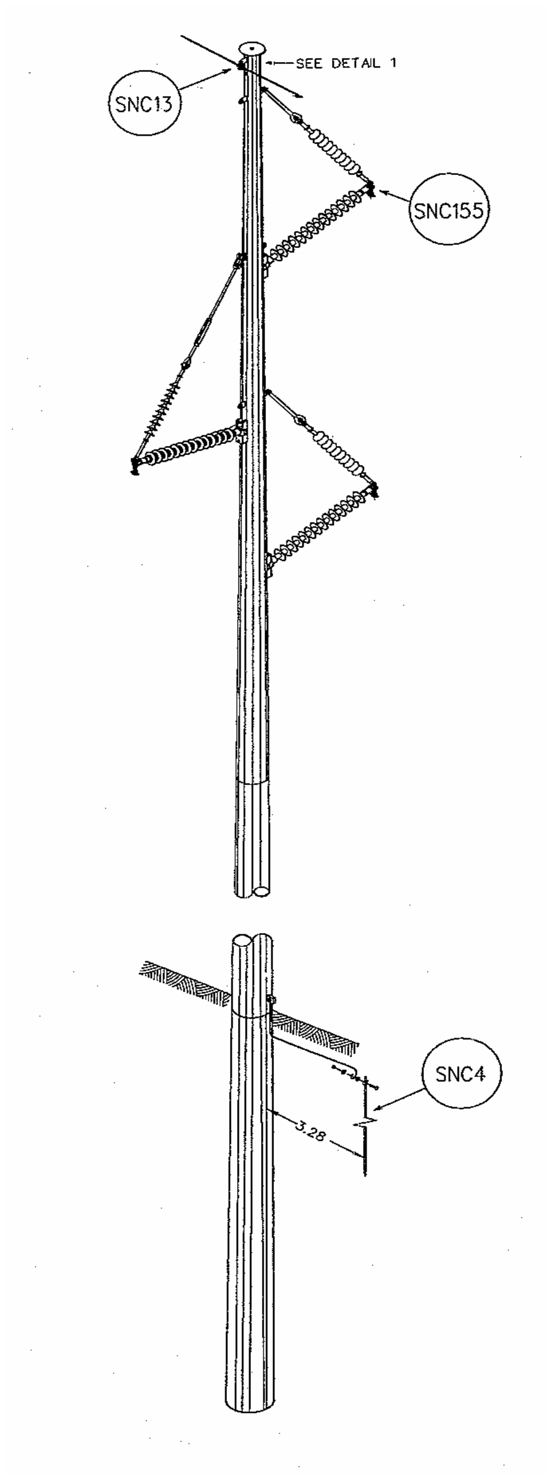
Figure 5-4
240kV Three Pole Heavy Angle Structure

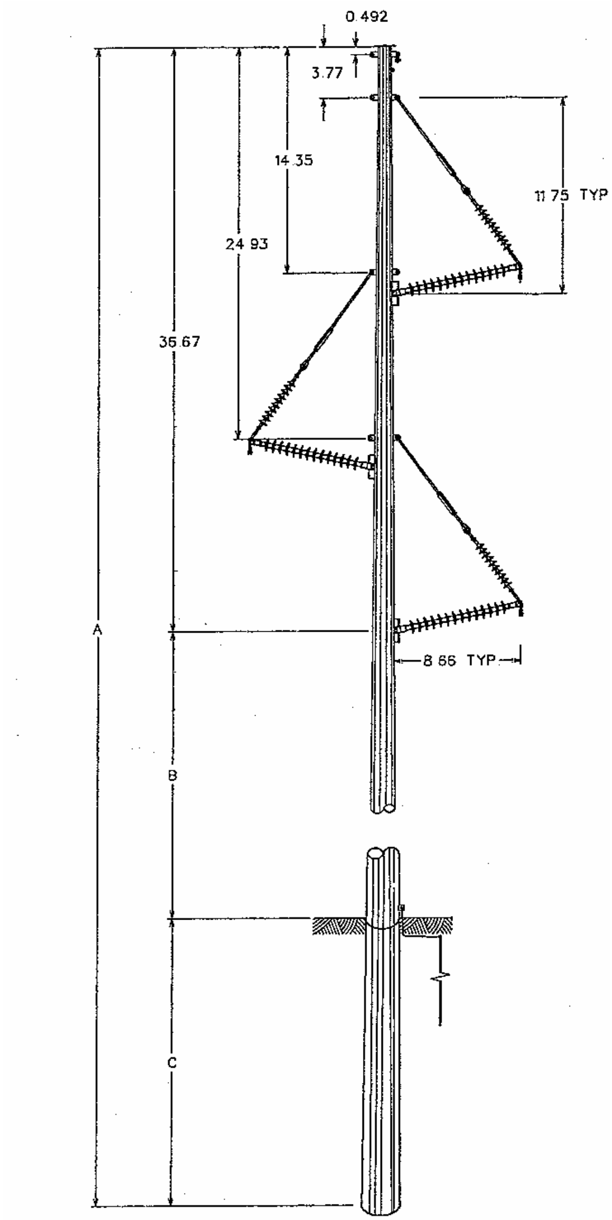


Deflection: 5 to 20 Degree Line Angle

Pole Dimensions		
A	B	C
75	48.78	11.5
80	51.28	12
85	55.81	12.5
90	80.3	13

Figure 5-5
240kV Three Pole Medium Angle Structure

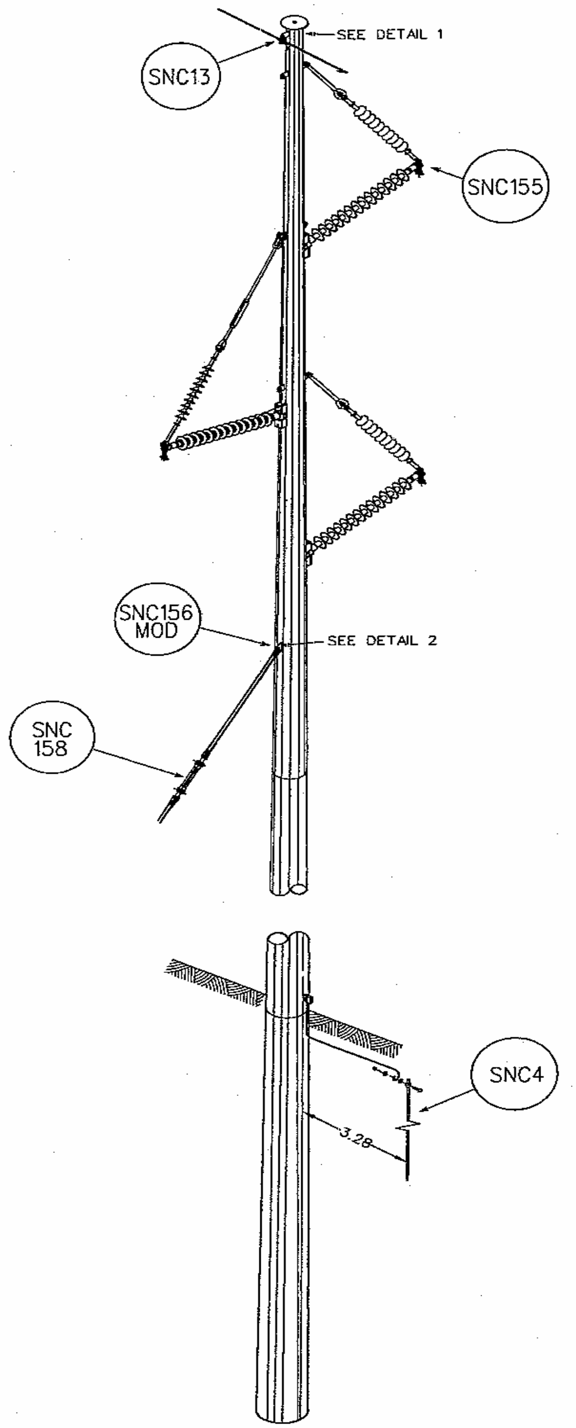


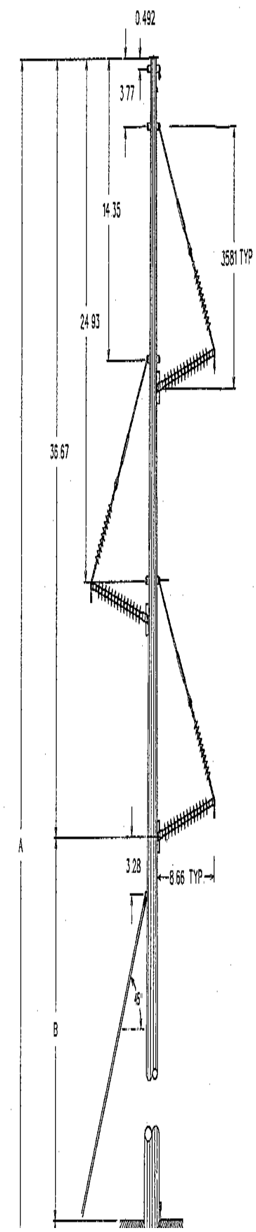


Single Pole ROW Detail		
Pole Location	ROW Distance (feet)	Safety Zone Distance (feet)
County Road ROW	6.72	20
Outside County Road ROW	13.28	20
Through Farmers Field	20	20 (either side of ROW)

Pole Dimensions		
A	B	C
80	31.28	12
85	35.78	12.5
90	40.28	13
95	44.78	13.5
100	49.28	14

Figure 5-6
240Kv Monopole Tangent Structure





Single Pole ROW Detail		
Pole Location	ROW Distance (feet)	Safety Zone Distance (feet)
County Road ROW	6.72	20
Outside County Road ROW	13.28	20
Through Farmers Field	20	20 (either side of ROW)

Pole Dimensions		
A	B	C
80	31.28	12
85	35.78	12.5
90	40.28	13
95	44.78	13.5
100	49.28	14

Figure 5-7
240kV Monopole Light Angle Structure